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News



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APRIL, 1948 — 50c per Copy

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BUTANE-PROPANE *News*

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April, 1948, Volume 10, Number 4.
BUTANE-PROPANE News is published monthly. Copyright 1948 by Jenkins Publications, Inc., at 1709 W. Eighth Street, Los Angeles 14, California. Subscription price: United States and U. S. Possessions, Canada, Mexico, Cuba, South and Central American Countries (in advance), 50¢ per copy, one year \$2.00; two years, \$3.50; three years, \$5.00. All other countries \$3.00 per year. By air mail \$7 per year, in U. S. only. Entered as second-class matter May 29, 1939, at the post office at Los Angeles, California, under the Act of March 8, 1879. Member of Audit Bureau of Circulation: Associated Business Papers, Inc.

Publishers: GAS, The Magazine of the Gas Utility Industry; HANDBOOK BUTANE-PROPANE GASES; THE BOTTLED GAS MANUAL; WESTERN METALS; Annual BUTANE-PROPANE News CATALOG.



LETTERS

OUR READERS are invited to submit to our technical editor any installation, service, or operational problems which they cannot solve for themselves. There is no charge for this service. More than 600 letters asking for different kinds of information were received last year.—Editor.

Gentlemen:

A customer came in our office and requested that we place needle valves on all his LP-Gas appliances. A friend had informed him this would reduce his gas expense 50%.

We failed to agree to above recommendation, which caused the customer to think we are not properly informed about the behavior of butane gas.

We suggested that we place this question in hands of some other authority for an opinion. Will you please give us what information you have on this?

D.G.W.

Arkansas

An appliance properly adjusted being served with liquefied petroleum gas at constant pressure from a good regulator will burn more efficiently as it is.

The addition of needle valves ahead of the appliance on burners is a waste of time and money and will not reduce the gas consumption.—Ed.

Gentlemen:

The discussion has come up in our company as to the worth of each customer. I refer to selling a business. Several years ago the rate was \$5 per customer; however we are wondering

if this evaluation hasn't gone up a great deal. Any information regarding this matter will be deeply appreciated.

J.S.S.

Texas

The value of a customer is based upon the earnings per year per customer.

The value to a buyer would be determined by the earnings per customer and the type of contract with the customer and the chances of competition taking the accounts away.

It is impossible to advise you of the value of your business and if you are planning to sell you should have a competent engineer make a valuation of your property and business.—Ed.

Gentlemen:

We would appreciate knowing the ultimate and the recommended Orsatt flue gas analysis of propane and butane. I have in mind particularly the safe CO₂ content of the flue gases from a gas furnace using propane.

O.W.B.

Wisconsin

We refer you to our "Handbook Butane-Propane Gases" for combustion data on liquefied petroleum gas. Reference to combustion characteristics of the hydrocarbons starts on Page 29 of the Third Edition of the Handbook and the combustion table (No. 6) appears on Page 32. Do you have a copy of the Handbook?

The theoretical composition of the products of combustion of propane are 3.0 parts of carbon dioxide, 4.0 parts of water, and 18.912 parts of nitrogen when measured by volume.

When measured by weight the products of perfect combustion are 2.996 carbon dioxide, 1.635 water, and 12.081 nitrogen.

Commercial propane may vary a little from the pure component as it may contain a little ethane.

Sufficient excess air must be supplied to in-

sure complete combustion and in checking with an Orsatt, care should be taken to be sure no carbon monoxide is present.—Ed.

Gentlemen:

We are considering selling propane gas to a neighboring bulk plant during the winter months, but have no meter to measure it with.

We are planning on weighing in their tank truck empty, then weighing it back filled. Would it be necessary to take the temperature of this gas to make this method of measuring accurate?

Iowa

In weighing empty and filled tank trucks, the matter of temperature need not be considered. The difference in weight will indicate the amount of fuel loaded.

In the "Handbook Butane-Propane Gases" (Third Edition) you will find a chapter on volume correction factors (beginning on Page 50), and tables which will be helpful to you when you desire to know specific gravities.—Ed.

Gentlemen:

We have some customers here who are interested in a heater for heating their water and farm livestock tanks for the winter season. I understand there are manufacturers making this equipment and we would appreciate it if you could furnish me the names and addresses of such concerns.

Nebraska

A company which is marketing a specially built heating unit for stock tanks is the Heating Equipment Co., 805 So. Peoria, Tulsa, Okla.—Ed.

Gentlemen:

Could you give us some information on the following: We have a dry cleaning plant using a 15-hp. boiler for steam, which is oil fired. It runs eight hours per day, using approxi-

mately 800 gallons of oil per month.

The present oil price is 12 cents per gallon. Would the savings be worth the cost of conversion, if this job could be converted without changing boilers on propane at 11 cents per gallon?

E.F.T.

California

Normally the operation of a dry cleaning plant is intermittent. The comparative price of the two fuels would, offhand, not justify the changeover, but we believe that the change would be justified in the saving in time of bringing the boiler up to pressure in the morning and the saving in maintenance and time required to service the oil burner and system.

An oil burner usually is not most efficient in on-and-off operation and some fuel saving might be accomplished by use of gas fuel under these circumstances.

We would not recommend that you guarantee a saving in fuel cost but we believe the over-all savings will justify the changeover.—Ed.

Gentlemen:

Is it necessary to hydrostatically test ICC cylinders (4B-240) that never cross state borders and that are delivered exclusively by our own trucks?

C.W.

Ohio

If a 4B-240 cylinder is used in the LP-Gas industry, interstate or intrastate, it is subject to retest as is specifically set out in Par. 1.6 (a) of the National Board of Fire Underwriters Pamphlet No. 58.

If you do not have a copy of this manual, it can be obtained free of charge from the National Board of Fire Underwriters, 222 West Adams St., Chicago.—Ed.

Gentlemen:

I am having trouble with one of my customer's brooding houses. He is complaining of moisture on the walls and extreme sweating from the propane gas.

Can you tell me how to remedy this? I have suggested to him to ventilate more, but is that the answer? He has asphalt roofing and the whole

brooder house seems too tightly enclosed to me, but he is reluctant to have too much air as his gas bill would go up. He is using propane brooders.

I would appreciate it if you could give me some suggestions as to how to remedy this matter. He claims that if he were brooding turkeys, this excessive moisture would kill them.

I can't tell you how much your promptness in answering my questions in the past has aided me. Your monthly News is the only book on the market in my opinion.

J.J.B.

Oregon

There has been much debate upon the relative merits of various types of brooders and the gas brooder has proved its worth as is evidenced by the large number of successful installations made.

To operate successfully, these brooders must have sufficient fresh air and the building requires venting to remove the products of combustion and the moisture given off by the chicks.

It is not necessary to keep the entire building at a high temperature as one of the fundamental points of the gas brooder is the fact that the temperature under the hood is the determining factor which is adjustable.

Gas requirement is secondary to the health and quality of the chicks and we believe your customer is using the wrong method of trying to save money by operating as he does.—Ed.

Gentlemen:

We have entered the bottled gas business in the retail field and are anxious to get information relative to accounting, as to forms and cost, etc. Would you be kind enough to furnish us with that information?

S.H.C.

Massachusetts

I refer you to the Ross-Martin Co., 423 E. 4th St., Tulsa, Okla.

This firm, after much research and with the cooperation of the National Butane-Propane Association, Minneapolis, has arranged for the publication of all manner of forms which are used by liquefied petroleum gas dealers. These not only will undoubtedly meet your needs, but you may be assured that they represent

the consensus of wide opinion upon the best forms for liquefied petroleum gas operations.—Ed.

Gentlemen:

Being a subscriber, we thought it advisable to write you regarding the possibility of securing data on operational cost of propane (2550 Btu) fuel to gasoline in the operation of a light $\frac{3}{4}$ -ton, 6 cylinder, 1947 Ford truck.

At the present time we are paying 26½ cents per gal. for regular gasoline. What would be the equivalent cost per gallon of propane fuel?

G.L.T.

Indiana

For conservative figuring, you can estimate the use of propane to be between 10% and 15% of the gallons of gasoline.

At 26.5 cents per gallon for gasoline, your propane would have to cost you between 23 cents and 24 cents (including road tax) to be equal on a fuel cost basis.

The savings in maintenance and lubricating oil and the better performance of your engine would justify the changeover at equal fuel costs.—Ed.

Gentlemen:

Do you have any cost comparisons on smoking hams, bacon, etc., with LP-Gas at 21 cents per gallon over steam or wood?

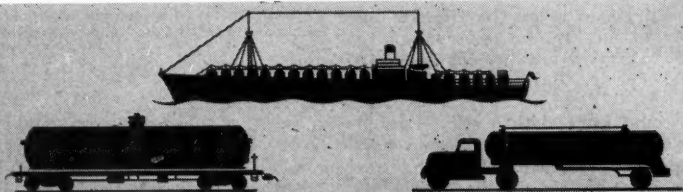
C.N.K.

Idaho

On page 225 of the "Handbook Butane-Propane Gases" there is a description of a meat smoking plant 10x10x31 ft. high. Operating temperatures are 130 to 180°F., with a production rate of 40 tons of smoked meat per month.

Gas consumption was 782,000 Btu per ton, which would be about 8½ gals. per ton. At 21 cents per gallon, the fuel cost would be approximately \$1.78 per ton or \$71.20 per month.

Compared to the price of meat, the fuel cost is so low that we believe the better temperature control obtainable with gas would result in a superior product that would probably cover the cost of fuel.—Ed.



LIQUEFIED PETROLEUM GASES

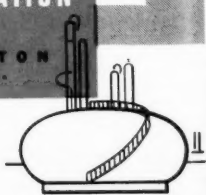
WARREN'S GLADEWATER, TEXAS PLANT



WARREN PETROLEUM CORPORATION

TULSA, OKLAHOMA

**DETROIT MOBILE HOUSTON
NEWARK, N. J. MT. VERNON, ILL.**



BUTANE-PROPANE News

COMMENT

EIGHT full pages of the March issue of "Fortune," the class magazine published by Time, Inc., review the growth of the LP-Gas industry. It is a straight-forward account of production and distribution problems, illustrated with pictures showing some of its uses.

As well as tracing the flow of LP-Gases from source to consumer, the substance of the article is an excellent over-all description of the industry. The supply problem is analyzed acutely, with no reservation on predictions for the future of the business. The material should be of interest to every LP-Gas dealer.

After many months of intensive surveys and analyses of innumerable business forms used by industry members, the National Butane Propane Association has realized its ambition to give butane-propane dealers everywhere a set of standardized records which have been developed for the specific needs of dealers in this industry.

Because the operations of the average dealer differ from those of businessmen in almost every other industry, dealers have found it necessary to develop their own business forms. This has been a slow process and often inadequate because of limited experience. These new forms, now ready for purchase from the Ross-Martin Co., Tulsa, Okla., should answer every business need of LP-Gas dealers.

Do you know of anything more important than safe operation in your business?

The June issue of BUTANE-PROPANE News will be almost exclusively devoted to information covering established safe practices in the LP-Gas industry. Look forward to it, but if you want any extra copies, orders must be received by us by May 1.

Six hundred twelve tank cars were built in the first 6 months of 1947, and approximately 1000 in the last 6 months of 1947. The January, 1948, production is estimated at 200. Total estimated tank cars in LP-Gas service on Feb. 1, 1948, were 5542.

Production of LP-Gas for the first 11 months was up 35.69% over the same period of 1946.

Shipments for use as fuel, excluding shipments to refineries, were up 45.78% in the first 11 months of 1947 over the same period of 1946.

New production facilities have, for some time, been under way in Argentina, Peru, Columbia, Dutch West Indies and Venezuela, which should answer the question of the effect of South American export. Production also continues to increase in this country and Canada.

Whereas LP-Gas is in short supply, it would appear from general reports that conditions are not as bad this winter as last and should be much improved before another winter arrives.—LPGA Bulletin.

By Ed.



W. R. CHRISTOPHERSON
Guest Editor for April

Short Pause for Meditation

By W. R. CHRISTOPHERSON

President, Association of Iowa Marketers
of LP-Gas, Spencer, Iowa

WE would be big operators and buy lots of appliances if our suppliers would ship something to us instead of shipping everything to some one else, but why were our appliance sales and profits larger last year than any other year?

We have no cylinders and no supplier ships us enough to do any good but how did we make more gas installations last year than any other year in spite of the fact that we already had all of our customers on single cylinders? And what would I do if they shipped today all the cylinders we have on back-order?

We cannot get nearly as much gas as we need so we cannot supply all the new customers necessary to stay in business but I wonder how we sold 30% more gas last year than we sold any other year?

We have too many regulators and no place to use them but I wonder how many we would have if the supplier had not agreed to change the shipping schedule on those excessive non-cancelable orders I placed?

We can buy all the items in short supply in the "Gray Market" but could that market exist if I did not patronize it?

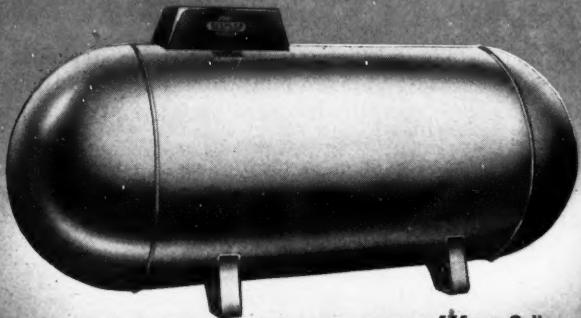
We just paid our income tax, and what a price they charged me for my new car! Our employes draw 75% more salary than they did and our new building cost twice as much as it should. All of that worn-out equipment has been replaced and our buildings are in excellent repair.

We lost more new sales than we made last year because we didn't have the merchandise but how could we have all of our bills paid if the suppliers didn't supply?

GOD BLESS OUR SUPPLIERS!

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...AMERICA'S FINEST LP-GAS PLANTS



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- 3 28 years' tank building experience, two factories
- 4 Compare Buehler quality, prices, service.

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Care in Design Gives Bulk Plant Outstanding Safety Features

By E. D. DAVIES

Sales Manager and Chairman of Safety Committee of
Petrolane, Ltd., Long Beach, Calif.

Drawings by Frank M. Taylor

BEFORE Petrolane's California St. liquefied petroleum gas bulk storage plant reached the blueprint stage last year, we determined that this plant must be the last word in safety — as free from hazards as the collective ideas of experienced LP-Gas men could make it. Storage tanks to accommodate 50,000 gallons of butane and propane* were to be installed at this location atop famous Signal Hill in Long Beach, Calif.; but what was more important, hundreds of thousands of gallons were to be *handled* here each month.

Petrolane had long envisioned a bulk plant at which, during a transfer of LP-Gas, the flow of all liquid and vapor from storage could be stopped *instantly* in case of a line break. Experiments with the mechanical means of accomplishing this task proved sound and here was to be an installation where a positive, instant shutoff would be of immeasurable value. In attempt-

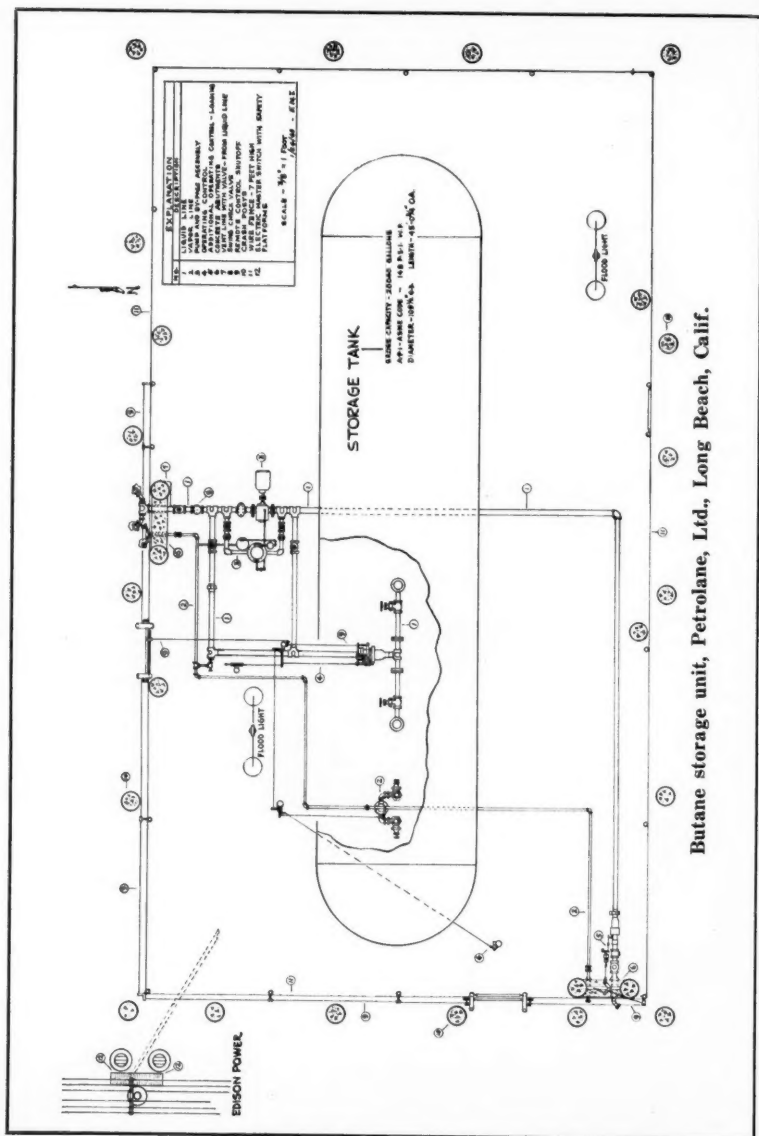


E. D. DAVIES

ing to locate the shutoff control as strategically as possible, the advantage of its establishment in several locations was recognized and so the idea of a remote control shutoff was developed.

The remote control shutoff consists of (1) a cable extending at shoulder height along three sides of the fence which encloses the two

* The terms "butane" and "propane" are intended to mean commercial butane and commercial propane throughout this article.



Butane storage unit, Petrolane, Ltd., Long Beach, Calif.

storage tanks. A tug at the cable actuates (2) a mechanical device built by Petrolane. This device in turn closes (3) the key valve in the line. The plant operator or truck driver makes a transfer of LP-Gas at this plant secure in the knowledge that he can close the critical valve in the liquid line and the vapor line merely by a tug at the cable.

Another feature of the plant is the method of handling both butane and propane without danger of intermingling the two products. Both the butane tank and the propane tank have their own loading terminals, piping and pump entirely independent of the other. This provision was made to forestall any possibility of allowing propane to enter the butane tank. As an added precaution, the piping, pump, valves and fittings on the propane system are painted red, while the entire butane system is painted aluminum.

Leave Blending to Manufacturers

Many LP-Gas dealers handling butane and propane manifold their tanks and use the same pump to move both products. One practice which has grown from such handling is "Pressure gauge blending" in which the dealer adds propane to his butane stock to increase its vapor pressure. All blending should be left to the manufacturers who have the laboratory equipment to make tests necessary for producing various blends of liquefied petroleum gas.

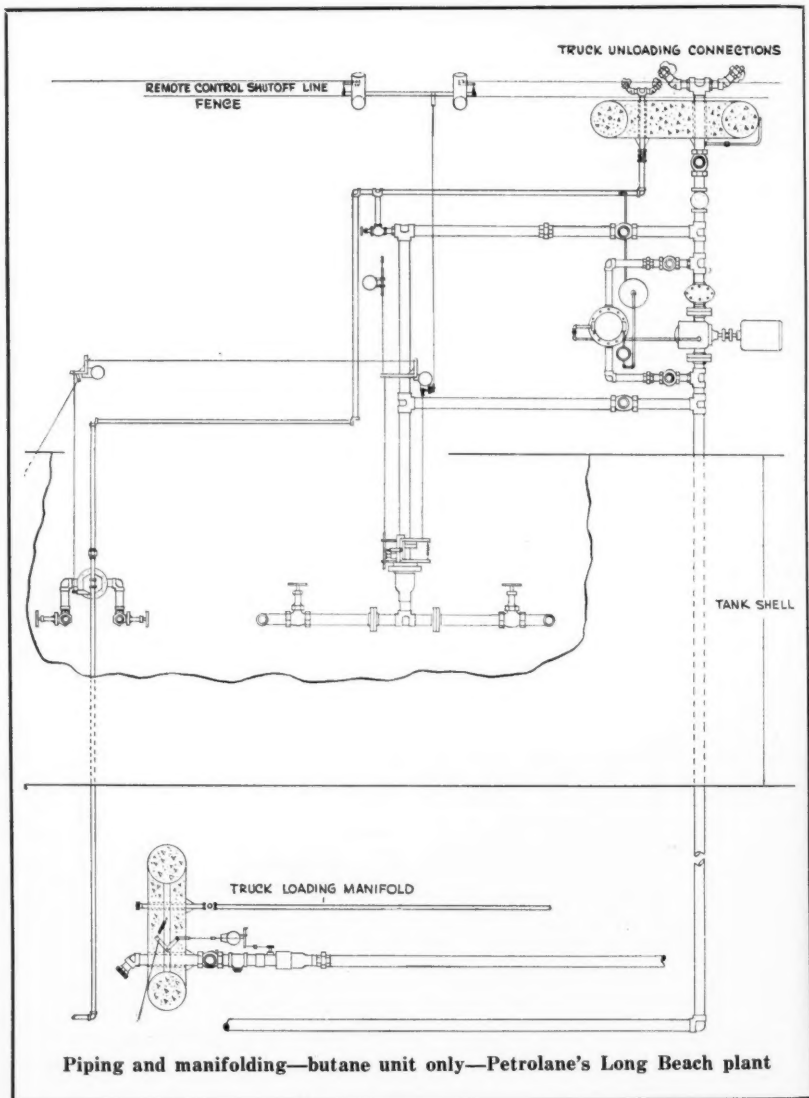
To demonstrate several of the safety features of the California

SAFETY IN BULK PLANT OPERATION. based upon correct engineering design and careful employe training, has enabled Petrolane, Ltd., Long Beach, Calif., producers and distributors of liquefied petroleum gas, to construct a bulk plant in which effort has been made to incorporate the approved safety features. The accompanying article, drawings and photographs will give the reader an excellent picture of a bulk plant which offers many important safeguards for others planning similar construction.—Editor.

St. plant, let us presume that a truck and trailer load of butane has arrived at the plant for unloading.

The truck driver spots his truck and trailer at the butane unloading terminal along the fence on the north side of the installation. The north side is restricted to *unloading* either butane or propane, since *loading* facilities for butane are along the west fence and propane is loaded on the south. The driver blocks his truck wheels (standard procedure on all stops) and inspects the plant piping. The rotary gauge reading is taken on the storage tank to determine that the tank will take the intended delivery and also for inventory record purposes.

If everything is found to be in order, the driver sets out his Dugas fire extinguisher alongside the truck where it is readily available. Although the bulk plant is equipped with strategically placed Dugas extinguishers, the practice of setting out the truck extinguisher prior to making a hook-up on any type of LP-Gas delivery or pick-up is standard Petrolane procedure. The driver connects his



liquid and vapor hoses to the plant terminals which protrude through a concrete wall or curbing, which stands just inside and parallel to the wire fence. The only piping which appears outside the wall are the liquid and vapor terminals to which the driver connects his transfer hoses.

Should the driver fail to disconnect his hoses before driving away, any resulting break in the plant piping would be restricted to the portion extending outside the wall. Lugs have been welded to the piping just inside the curbing to prevent the pipe from sliding through the openings should a force be exerted directly away from the wall.

The wall is 12 inches thick, 56 inches long, stands 3 feet above ground and 1 foot below ground. Two posts made from 12-inch casing reinforce the curbing at either end; they are filled with concrete and extend 3 feet below ground.

After connecting his hoses the driver must open the correct valves to direct the liquid through the pump and into the storage; he is then ready to open the vapor valves as well as the liquid and vapor valves on the transport. The pump, powered by an explosion-proof motor, is started and butane flows through the lines encased in the curbing, through the swing check valve (which permits a one-way flow only), through the pump, and through the "internal" valve, which is the basis of the remote control shutoff. After passing the "internal" valve the liquid comes to the "T" in the line and enters the tank through two openings equipped with excess flow valves.

To insure safe operation of the bulk plant, a set of operating instructions has been printed and distributed to all Petrolane employees concerned. Although the driver would not be allowed to

Petrolane's California St. plant at Long Beach, Calif., as viewed from the northeast.



Table 1. Storage Tank Specifications

	<i>Tank No. 1 (Butane)</i>	<i>Tank No. 2 (Propane)</i>
Gross capacity	20,000 gals.	30,000 gals.
Maximum working pressure	140 lbs.	250 lbs.
Liquid openings	2 3" openings with excess flow valves	2 3" openings with excess flow valves
Vapor openings	2 1" with excess flow valves	2 1" with excess flow valves
Rotary gauge	Head installed	Head installed
Relief valves	3 2"	3 2"

make a delivery to the California St. plant before receiving on-the-ground training for its operation, he could be so successfully by following the printed instructions. Every conceivable movement of LP-Gas has been outlined step by step, and, since all valves, switches and other mechanical devices are identified by painted numbers of numbered metal tags, the correct position and operation of each is made plain.

After the driver has completed his delivery, he closes all valves, including those on the truck and trailer. He has yet to dispose of the liquid in the transfer hose. This is accomplished by means of a stack which has been placed in the plant piping just outside the last globe valve. By opening the stack valve the driver blows the liquid to the air through the stack which extends approximately 20 feet above the ground.

A delivery of propane is made to the California St. plant in much the same manner. The transfer hose hook-up is made at the propane unloading rack, also on the north side of the fenced enclosure,

alongside the butane unloading rack. The safety features in the unloading side of the propane system are either identical or similar to those in the butane system.

The specifications of the two storage tanks are shown in Table 1.

For the sake of brevity, details regarding shell thickness, pressure gauges, etc. will not be discussed. It is well to mention, however, that the desired working pressure of the butane tank was determined by considering the maximum temperatures experienced in Long Beach, and by considering the vapor pressure of commercial butane commonly produced in California under the standards of the California Natural Gasoline Association. The working pressure of 140 pounds per square inch exceeds the maximum working pressures to be encountered by a comfortable margin.

The entire installation is guarded against tampering by a 7-foot fence, making an enclosure approximately 65 feet by 50 feet. Crash posts made from 12-inch casing are strategically placed both inside and outside the fence to pre-

vent injury by the trucks to the tanks and piping. The crash posts are filled with concrete and stand 3 feet below ground and 3 feet above ground.

Night loading operations are illuminated by vapor-proof flood lights mounted on standards. Vapor-proof switches are provided and all wiring is in conduit. An insulated platform has been provided for the driver or operator to stand on when he operates the main electrical circuit switch.

All truck drivers are required to remain at a station located between the truck and the loading or unloading terminal during the transfer operation. In order to discourage the driver from leaving his station during rain or bad weather, "doghouses" have been placed alongside the fence adjacent to the loading terminals. The "doghouses," which are made of pipe and covered with corrugated iron, are about the size of a telephone booth. The three sides which are

covered are closed only to within 6 inches of the ground to avoid the possibility of creating a vapor pocket. The top of the "doghouse" is elevated a few inches from the sides in order to provide ventilation from the top.

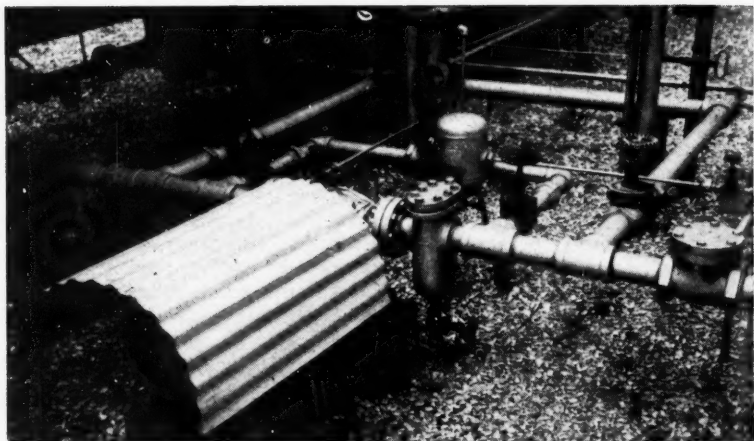
All liquid piping in this plant is 3 inches in size and all vapor lines are 1 inch; both are, of course, extra heavy. The propane system is equipped with a Model M-4 Smith pump rated at 150 gallons per minute. Butane is transferred by a Model 300 Smith pump rated at 100 gallons per minute.

The butane pump is equipped with a Fisher by-pass valve and a Wizard pilot-operated regulator. Since the reader is probably aware of the purpose of a pump by-pass, it will suffice to say that it relieves excess pressure built up by the pump and circulates the compressed LP-Gas from the discharge side of the pump back to the tank.

With the volume of liquid handled through a 3-inch line driven by



Close-up of unloading terminals on north side of plant. Liquid and vapor piping to which long line trucks are connected for unloading can be seen protruding through concrete curbsings; propane at left, butane at right. Butane and propane remote control cables are faintly visible along fence.



General view of butane system manifolding showing complete by-pass arrangement. Note at extreme right swing check valve in unloading line, heavy duty strainer on suction side of pump. At top right can be seen the handle-like manual control lever for opening the "internal" valve in the liquid line.

a pump rated at 100 gallons per minute, it was necessary to install this specialized equipment to avoid the "chattering" in the lines which would be caused by a sudden opening or closing of an ordinary by-pass valve.

A Bailey by-pass valve is provided for the propane pump. It is a spring-loaded valve and is set to operate at 40 lbs. differential pressure. Imposed on the one side of the valve is the pump pressure. Imposed on the other side of the valve is receiving tank pressure. When the pressure builds up to 40 lbs. above receiving tank pressure, the valve opens and allows the propane to by-pass.

Each tank has two 3-inch liquid openings on the bottom of the shell. In each opening is placed an ex-

cess flow valve as required by the California Liquefied Petroleum Gases Safety Orders. Two liquid openings were provided in each tank in order to make certain that a sufficient volume of liquid would be fed to the pump.

A 3-inch excess flow valve in a 3-inch line creates considerable restriction, although on paper it could possibly be demonstrated that sufficient liquid would pass the excess flow valve to feed the pump at 100 gallons per minute. However, we have found through experience that excess flow valves will not always work out in practice as they should. Therefore, it is necessary to come out of the tank with two 3-inch lines and "T" them beyond the excess flow valves. In this manner the pump may be fed by

the two more or less restricted openings from the two tanks. For the same reason each tank was provided with two vapor openings. They are equipped with excess flow valves and "T'd" in the same manner as the liquid lines.

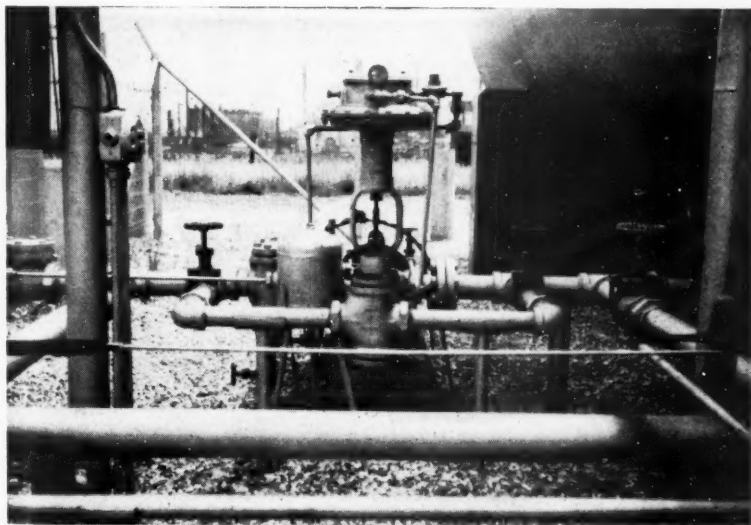
Remote Control Shut-off

In order to avoid confusion while explaining the remote control shut-off, let us first assume that we are speaking only of the butane system.

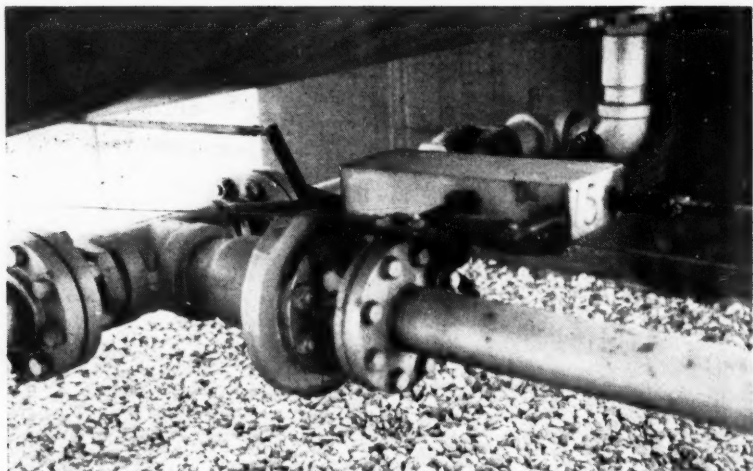
Immediately after the "T" of the two liquid outlet lines, an "internal" valve has been installed. The "internal" valve is so named be-

cause it is normally placed inside the tank at the liquid outlet. It is a spring-loaded valve, manually operated by a one-quarter turn on the lever.

To hold the valve in open position we have attached a notched bar to the lever. To open the valve the operator pulls on the bar against the spring tension of the valve itself; to hold the valve open, the operator presses downward to fit the notch in another bar set at a right angle. With the internal valve held in open position in such a manner, it requires only a slight upward pressure on the notched bar to dislodge the notch and allow the valve spring to contract, closing



The numeral "15" is marked on the case which encloses the mechanism for tripping the "internal" valve by cable. At the upper right can be seen the 3" piping extending from one of the two liquid openings in the butane tank. The "internal" valve is located between the flange connections.



Another view of the by-pass in the butane system which clearly outlines the pilot operated Fisher regulator.

the valve. By means of a mechanical device and a system of linkage, the tripping action to dislodge the notched bar is accomplished by a tug at the cable.

In case of a break in the plant piping only the LP-Gas contained in the line would escape, since the closing of the "internal" valve by the operator or driver would hold the tank contents intact. In each of the mechanical devices which actuate the "internal" valve, a fusible link has been installed. This provides for an automatic closing of the valve in case of fire since the fusible link is designed to melt at 200° Fahrenheit.

The identical remote control system is provided in the 1-inch vapor piping. While it is necessary to open the vapor "internal" and the

liquid "internal" separately, they are closed simultaneously in one tug at the same cable.

Undoubtedly, the part of the piping most susceptible to a break is the loading terminal extending through the concrete curbing. In designing the plant this fact was recognized; also, it was realized that over 50 feet of 3-inch line would empty its liquid content should the terminal be broken. Therefore, another "internal" valve was placed in the liquid line just inside the concrete curbing. It will be seen that a driver must open 3 "internal valves," two liquid and one vapor, before he can load his truck. However, *all three* are closed by a tug at the cable extending along the fence. It was not necessary to install an "internal" at the

unloading terminal, since a swing check valve just inside the concrete wall prevents an outward flow.

This completes the brief description of how the remote control shutoff serves in the butane system. To describe its function and design in the propane system would be mere repetition, as they are identical. The only difference is the color of the cable—red to identify propane and aluminum to identify butane.

Internal Valves on all Trucks

The reader will possibly be interested in the fact that the liquid opening of the cargo tank on every Petrolane-operated truck is equipped with the same spring-loaded internal valve which is the foundation of the remote control shutoff at the California St. plant. To open the valve, the driver pulls (against spring tension) on a bar linked to the valve and latches it by means of the notches. He closes the valve by a gentle slap of his hand to dislodge the notched bar. We are working at present on a linkage system which would enable us to incorporate the closing of the truck internal valve through the remote control cable.

It is our sincere hope that all LP-Gas dealers who believe that there is merit in the remote control shutoff or other features of the California St. plant will adopt them for their own use. We shall be glad to show visiting dealers through the plant, and give whatever assistance we can toward making their own bulk storage plants safer to operate.

Industry Gets Representation On National Petroleum Council

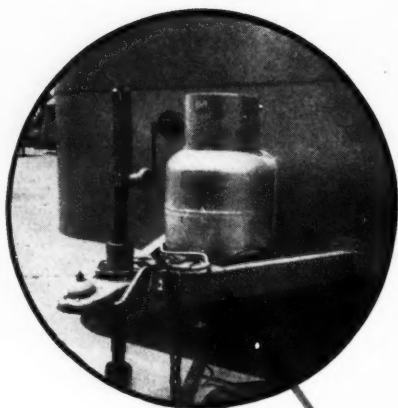
A February bulletin issued by the Liquefied Petroleum Gas Assn. states that as a result of an appeal to Secretary of the Interior Krug and Walter S. Hallanan, the LPGA was granted permission to nominate members from its Marketers Section to serve on the National Petroleum Council.

Four marketers and Howard D. White, executive vice president of the LPGA, were appointed. Representatives of producing companies were already on the committee. The result is that a committee of the Council has been constituted to deal exclusively with LP-Gas. The whole committee follows:

W. K. Warren, Warren Petroleum Co., Tulsa, chairman; Louis Abramson, Jr., Petrolane Gas Co., New Orleans; C. M. Ambrose, Liquefied Gas Corp., Seattle; C. F. Dowd, Tidewater Associated Oil Co., New York; Louis M. Faber, Retail Gasoline Dealers Assn., Milwaukee; J. M. Gardiner, Republic Oil Refining Co., Pittsburgh; H. T. Goss, Arkansas Fuel Oil Co., Shreveport; B. C. Graves, Union Tank Car Co., Chicago; Charles S. Jones, Richfield Oil Corp., Los Angeles; R. S. Mitchell, Shell Oil Co., Inc., New York; C. R. Musgrave, Phillips Petroleum Co., Bartlesville; Irving Solsberg, Lehigh Petroleum Corp., Norwich, Conn.; H. K. Strickler, The Propane Corporation, Erie; L. L. Tonkin, Hope Natural Gas Co., Clarksburg, W. Va.; J. W. Vaiden, Skelly Oil Co., Tulsa; R. J. Walshe, The Texas Co., New York; Howard D. White, LPGA, Chicago; C. R. Williams, Natural Gasoline Assn. of America, Corpus Christi, Texas.

The National Petroleum Council was created by the Secretary of Interior and is an industry advisory council to the Department of Interior.

What Trailerites Should Do *To Play Safe*



By BOB SMITH

MANY U. S. families are finding room to live in house trailers during the nation-wide housing shortage hanging over from the upsetting wartime conditions. These wheel-dwellers are just as much interested in making themselves physically comfortable as people who flourish in homes on foundations of concrete and wood.

Among more than 476,000 mobile units serving as homes for approximately 1,300,000 displaced Americans, LP-Gas-fed appliances are giving trailerites more than a place to live. They are providing dwellers-on-wheels most of the conveniences and luxuries enjoyed by conventional homeowners.



Several thousand trailer people will approach LP-Gas distributors this year for information about the installation of heating, cooking, and lighting systems on their mobile homes. Many operators are prepared to supply the correct information and to sell the proper equipment to these gypsy-like dwellers. There are a number of dealers, however, who may not be sufficiently primed to help their customers choose, install, and service house trailer systems.

Abuses of safe practice for application of liquefied petroleum gas on trailers have been extensive. Irresponsible dealers take such hazards as filling home-made cylinders mounted on trailers. It must be remembered that although trailerites do not use a large volume of the fuel, their accident record and the treatment they receive has a great deal to do with their attitude toward the industry. As future home users of the product—and as people capable of either helping or harming the industry as a whole—they should be fairly treated; they should be given good service, and they should be properly informed about the product.

More than one question arises in connection with the use of liquefied petroleum gas in house trailers. Where should the cylinder be mounted? What size and type of tubing is most feasible? What are standard bottle-filling regulations? Cylinder specifications? Safety factors for mobile LP-Gas units?

A survey conducted among southern California trailer manufacturers, LP-Gas dealers and distributors, manufacturers who mer-



A trailerite turns key in her LP-Gas fueled floor furnace.

chandise mobile equipment, and Los Angeles fire department authorities, has unearthed the solutions to these trailer problems and many others. For LP-Gas men concerned about building business volume with cash-and-carry bottled gas sales and service to trailerites, the cross-section of the "house-on-wheels" picture itemized here will be profitable reading.

In the first place, LP-Gas is the chosen fuel of the trailer trade. It has virtually replaced gasoline for cooking because of its more economical, safe, and efficient features—and electricity, for both space heating and cooking, because it will produce *anywhere* while electric power sometimes has a difficult time catching up with the wanderings of gypsy-dwellers. Bottled gas



Most of the conveniences of home, including oven-equipped gas ranges, are enjoyed by trailer-dwellers.

can also supply economical lighting for trailers parked beyond the power lines.

Future developments promise added comforts for users of mobilized LP-Gas installations. A 5-gal. water heater that fits into the space limitations of "houses-on-wheels" has been produced. The evolution of a miniature gas refrigerator similar to models already being promoted by electrical appliance manufacturers is also a probability. Revolutionary space heating methods are being developed for trailers. And more than one manufacturer has already begun production on miniature four-burner stoves equipped with ovens.

For dealers and distributors building a reputable trade, there is more than the problem of merely satisfying growing consumer demand. Some of the pitfalls in the trailer field:

1. Not all types of cylinders are approved for use on house trailers.

2. Many dealers are selling complete systems without aiding or instructing retail buyers in installation methods.

3. Cylinders are being improperly filled in violation of city, county, and state fire prevention regulations.

4. Many trailerites who do not understand the nature of the fuel are using their systems unsafely.

All three types of approved cylinders—the ICC, the ASME, and the API-ASME—are satisfactorily constructed for service on house trailers. Only ICC bottles, however, are legalized for transport between states. Light weight makes them easier to move around.

Specifications for the fabrication of ASME and API-ASME cylinders, at the same time, are recognized as equal to ICC requirements. Most distributors will fill any approved type of cylinder for house trailer customers. Thorough instructions which apply to the filling and construction of LP-Gas cylinders appear in Freight Tariff No. 4, available at the offices of H. A. Campbell, Bureau of Explosives, 30 Vesey St., New York 7.

Although a variety of rules control the local consumption of LP-Gases in house trailers, the standards of the National Board of Fire Underwriters, (NBFU No. 58), are accepted universally throughout the industry for operating and for manufacturing procedures. There are a number of city, county, and state regulations, however, which differ with NBFU pamphlet No. 58 recommendations.

Strict regulations concerning house trailer cylinders are those of Los Angeles as interpreted by Chief Henry R. Boone, of the city's fire prevention bureau. Under Los Angeles specifications, which correspond to those of the State of California's Department of Industrial Relations, cylinders mounted on trailers should not exceed capacities of 15 gals. Even containers holding less than 5 gals. are required to be at least 5 feet removed from any source of ignition.

There are less rigid legal standards for installing LP-Gas systems on trailers than in Los Angeles, but the need for safe practice is just as great. Although most trailer manufacturers in southern California make it their business to know the best methods of installation, too many dealers are supplying LP-Gas material to trailerites without helping them with installation and instructing them on the use of the system.

Cylinders Mounted on Hitches

General practice calls for the LP-Gas cylinders to be mounted on the hitches of trailers, although there is no legal restriction from storing them in specially prepared compartments inside. In such cases, however, some means of ventilation to the outside should be provided. The trailer chassis factory of Howard F. Ward, Inc., Los Angeles, builds mountings for cylinders out of $\frac{1}{4}$ -in. angle iron. The bottles can either be attached to removable cross pieces of the iron which are bolted to the hitch, or they can be held securely by de-

tachable hooks attached to the angles. Ward chassis are used on the "West Craft" model trailers sold by George T. Hall Co., Los Angeles.

It is standard operating procedure for a pressure regulator to be attached to the cylinder. The copper tubing which runs to the appliances is looped at least once to take up the vibration in the system. Most trailer manufacturers have devised special brackets to secure copper tubing underneath the chassis. When installation is made, fittings and tubing should be tested with soapy water under at least 125 psi pressure.

Ample Tubing Size

Contrary to widely held opinion, liquefied petroleum gas is not a corroding agent. The reason for prescribing $\frac{3}{4}$ -in. tubing for house trailer systems is functional in nature. With the spreading use of LP-Gas-fed appliances by "wheel-dwellers," the need for sizes of copper tubing that will carry the new load is increasing. Units serviced with smaller than $\frac{3}{4}$ -in. tubing may not carry any more gas than that necessary to serve one appliance.

A 5-gal. tank of LP-Gas will fuel all the normal cooking needs of the trailer wife for a period of 30 days, but bottles should be filled only at bulk stations. In Los Angeles and in most other areas the filling of tanks on trailers is prohibited. No cylinder may be serviced within 25 ft. of a dwelling, mobile or otherwise. For this reason, the operations of dispensers who travel about from trailer camp to trailer

camp, filling tanks mounted on trailers, often are illegal.

As long as cylinders must be removed from the trailers for filling, it is good practice for consumers to convey them to bulk plants for service. According to Inspector Ralph E. McLaughlin, of the Los Angeles Fire Prevention Bureau, a number of insufficiently equipped LP-Gas tank trucks have attempted to operate in the area. These operators are taking such risks as filling cylinders which are not fitted with a dip tube or fixed outage indicators, and cylinders which have not even been removed from house trailers for weighing.

The Imperial Gas Co., Los Angeles, has all the facilities and goes by all the best methods for safely replenishing house trailer cylinders. As well as supplying informative pamphlets to customers, Imperial attaches caution tags to all new appliances. Under the supervision of Philip Koch, vice president, the company's dispensing station fills only approved bottles.

Filling small cylinders of 5-gallon capacity, or less, by the 10% gauge method is apt to be hazardous, warns Robert G. Hardie, of Imperial. Since only 13% on butane tanks and 17% on propane tanks is allowed for outage, a tank overfilled even by a half a gallon of gas does not have ample expansion space left. Mr. Hardie has discovered that overfilling 9-pound cylinders by 1 pound can cause them to bulge at the ends.

Cylinder Retest

ICC cylinders must be retested at either 5 or 10-year intervals, de-

pending on the method of test that is employed. If the tank has gone beyond the test date, it should not be filled until it is retested. The Imperial Gas Co. has a testing station at Huntington Beach, Calif. Even when these cylinders are filled by means of an outage pipe, the cylinder should still be checked by weight.

Storage Closets Vented

The most important item for users of LP-Gas in tight quarters, such as house trailers, to remember is that the product is heavier than air. If a leak develops in the system, ventilation must first be let into low spaces such as the bottom of compartments in closets. Whether gas is escaping or not, the gas should always be shut off at the bottle valve when it is not in use or when the unit is in motion.

Trailerites should never attempt to repair damage to systems. Experienced servicemen are best qualified to maintain LP-Gas units as well as to install them.

If distributors, manufacturers, and consumers of liquefied petroleum gas devices operating on "rolling homes" observe the safest practices in the installation, filling, and use of the systems, the uninterrupted advance of the conveniences of trailer life will continue. As long as obstacles like the shortage of house-building materials, the high rents, and the population displacement brought on by the war, prevail—and the perennial American wanderlust lasts, LP-Gas-fed appliances will be making life comfortably snug in the trailer camps.

How Codes Govern Tank Construction

By HERBERT A. BUEHLER

Buehler Tank and Welding Works, Los Angeles

IN this article, we shall consider one phase of LP-Gas tank fabrication, that of inspection while the tank is in process and also upon its completion.

The National Board of Fire Underwriters and other safety regulatory bodies have written regulations governing the design of pressure vessels, tanks and tank fittings as a safeguard to the public. These codes have been developed through years of experience. The codes are enforced by impartial inspectors, who, employed by the state, must pass examinations before they become qualified to test high pressure vessels.

Two principal codes govern the building of LP-Gas tanks. These are the ASME and the API-ASME. Tank labels are stamped with code markings as illustrated in Figures 1 and 2. The finished tank is serially numbered, then after final inspection a certificate is signed by the inspector. This certificate is filed in the tank manufacturer's office and is subject to examination

at any time. Details of the various tests as prescribed by the codes will be outlined in the following paragraphs:

Let us first review briefly the sequence of operations during the manufacture of an LP-Gas tank and note the points where inspection occurs. The procedure in the building of tanks is essentially the same by the various tank builders within the industry. However, in the case of some manufacturers, special methods and tools have been developed to simplify production and improve the products.

Flat steel received from the mill is first inspected by the tank builder's own inspector for possible lamination and other imperfections. This is checked at the time of



H. A. BUEHLER



Figs. 1 and 2. Facsimiles of stamps used by inspector.

shearing the steel to size. Steel defective for any reason is discarded and returned to the mill.

The flat steel which has been sheared for use in horizontal tanks

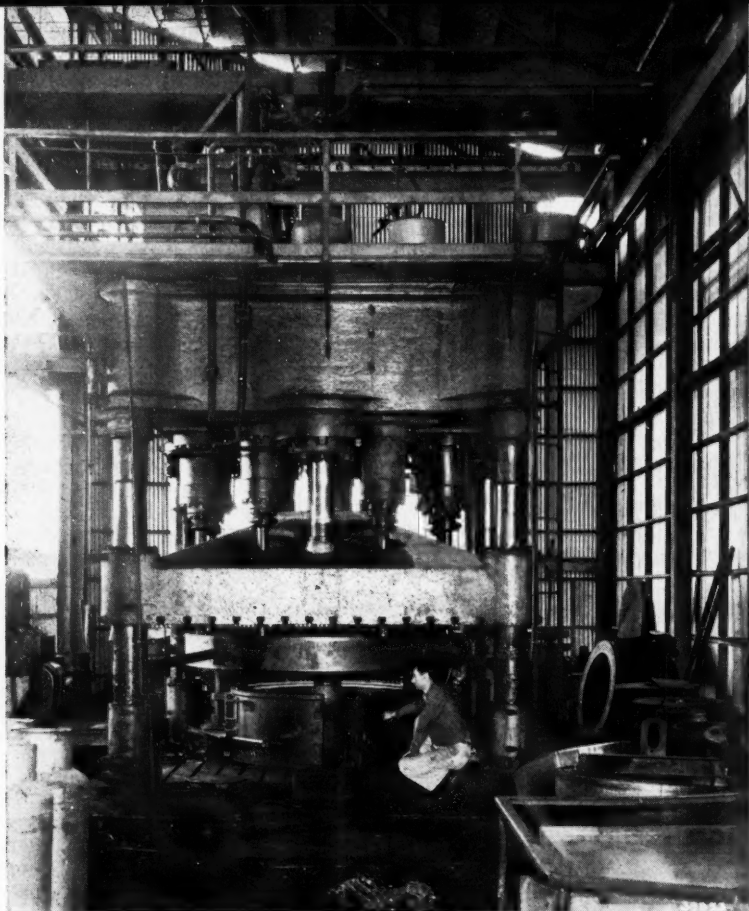


Fig. 3. This huge 2000-ton hydraulic press is used to stamp elliptical and hemispherical heads.

is rolled and formed into cylinders by heavy rolls. These rolled shapes or cylinders then move on to a sub-assembly department where openings for fitting flanges are located and cut. Flanges and couplings to

receive fittings are tack welded in place and then fully welded on the inside. Seams are also tack welded on the inside, cleaned and visually inspected before going to final assembly.

Tank heads and other components are next tack welded in position, these welds also being inspected. High amperage automatic welders, Figure 4, perform the final welding operation on all seams. Production line methods facilitate fast and easy handling of the material throughout the entire plant.

Hydrostatic Test

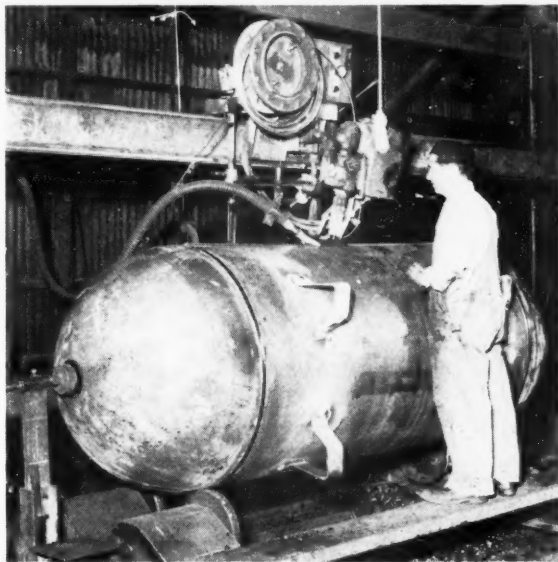
After completion of welding and inspection, the tank is conveyed to the testing department for the high pressure hydrostatic test. Tanks, to pass the ASME Code and to merit the U-69 stamp on the name plate, Figure 1, are designed for 200 psi working pressure. The hydrostatic

test, according to ASME Code specifications, consists of the following:

Water is pumped into the tank up to $1\frac{1}{2}$ times the working pressure. With pressure held at this point, the inspector makes the "hammer test." A hammer of a prescribed weight is used in a manner described by the code, whereby the weld is hammered its entire length. If leaks are discovered during the hammer test, they are immediately marked, repaired and tank re-tested.

After this first hammer test, the hydrostatic pressure within the tank is boosted to twice the tank's working pressure, or as in the case

Fig. 4. The 1200-amp automatic weld used on both longitudinal and girth seams.



of the ASME test, to 400 psi. Here, the state inspector takes over and conducts his own test, which is final. Upon completion, the tank is painted with a protective coating of zinc cromate, a paint found highly effective by the Army and Navy for primer use. A final coat of high quality aluminum is then applied. Aluminum or white enamel may be used for the final coat, as both meet the code specifications.

Tanks are then valved with fittings which have also been produced according to safety code requirements. In some cases, LP-Gas dealers and customers order tanks without fittings, in which event the fitting openings on the tank are plugged with seal caps to prevent moisture from entering the tank.

Tank Stampings

The API-ASME Code is written for tanks with a working pressure of 250 psi. At this pressure, the weld is hammer tested as previously described. The second and final hydrostatic test is made at $1\frac{1}{2}$ times the working pressure. API-ASME Code tanks are stamped for 250 psi working pressure. Also, stamp in Figure 2 is used on the tank label. Tanks built according to the first code described, the ASME, may be used for either butane or propane in any part of the United States. Buehler tanks built according to the API-ASME Code for 150 lbs. service may be used for butane but not for propane in California. Either the API-ASME Code for 250 lbs. working pressure or the ASME Code for 200 lbs.

may be used for propane in California.

Let us now examine the state inspector's job. His inspection covers many of the same points checked by the tank builder's inspection department. He checks the incoming steel for imperfections and for proper thickness, as well as inspecting parts in process. In addition, he conducts the final high pressure hydrostatic tests as just described. To assist the inspector in his work, tank welds are thoroughly cleaned to aid in the detection of leaks.

Final Inspection

The state inspector or resident inspector, as he is sometimes called, has authority to reject any and all tanks that do not come up to standard. His signature appears on the manufacturer's data sheet. While for tanks built in California for use in California, he inspects according to the API-ASME Code, nevertheless, he, by virtue of his training and authority, makes the ASME Code test for tanks to be shipped to states where ASME, 200 lb. Code tanks are required.

With these very rigid demands upon tank manufacturers for safety construction, there is very little danger of LP-Gas failure to the user of the fuel insofar as the tank or container itself is concerned. Legitimate tank builders the country over welcome these Safety Codes and help in every possible way to make the inspectors work effective. This results in the maximum safety to the public and to the industry.

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Repair Service

When It's Good It Beats Competition

By S. W. ELLIS

STEPPING up good service to super service enabled the dealer who introduced bottled gas to Arkansas to face growing competition so successfully that now he has one of the hand-somest stores in the state.

That dealer is B. H. George, owner of George's Maytag and Appliances, North Little Rock, Ark.

Mr. George concentrates his efforts now on installing new systems, with tanks of 150 to 1000-gallon capacity; supplying the most modern LP-Gas appliances, sold from a sales floor where appliances are shown to the best advantage; and rendering repair service from a shop that has been called "the repairman's paradise."

Customers who buy their gas systems and equipment from B. H. George have probably learned in ad-

vance about Mr. George's super repair service. His well-equipped service shop in the rear of the store is the talk of the town. Besides this, he has a workshop at his beautiful home, where he follows his hobby of turning out fixtures and unique devices for his store.

The repair shop in the store has every tool and device needed for repairing all appliances. Mr. George himself, is the master service man, for he has a passion for endeavoring to make perfect repairs, and returning the customer's repaired appliance without delay.



▲
B. H. George works at repair bench in his finely equipped shop.
▼



This mass floor display helps to sell butane heaters, water heaters and ranges.

The four service trucks and the big installation truck, all completely equipped with everything needed for service, drive as far as 100 miles to service systems and appliances sold by Mr. George. The owner tries to limit service calls to a territory within 35 miles of Little Rock, yet he will not refuse service to customers much farther away than this.

Recently he answered a service call that took the truck over rough roads to a remote district. That call took a full day's work for the truck and the repairman. Mr. George lost money on it, but he added another solid link to his service reputation.

Mr. George likes to show customers his neat repair department at the rear of the store. Because he keeps it spic and span, he often leaves the door open that leads into the store,

so that customers can see the shop, the equipment, and the work going on all the time that keeps LP-Gas appliances in good condition.

Hydraulic Lift

One of the features of the repair shop of which Mr. George is especially proud, is the hydraulic lift which he made himself. This lift enables one man to load or unload heavy appliances. The truck backs in from the alley and stops at the lift, which can raise the platform to the exact level of the truck bed.

Mr. George obtained the hydraulic cylinder that raises the concrete platform from an automotive supply dealer, and this was the only part he purchased. The power unit is an old air compressor motor and an oil-filled drum to maintain hydraulic pressure.

This unique device enables one man to roll the appliance on a dolly to or from the lift. Mr. George estimates that its use saves him at least one man on the payroll, and also it saves wear-and-tear on appliances.

Mr. George likes to use the word "service" often in his newspaper advertising. And he advertises consistently. At the beginning of each year he contracts for 1000 inches of display space, to be used at his discretion, but he always uses much more than that amount.

He likes to employ large space, and occasionally uses two colors. When warm weather begins, he runs one or more advertisements that cover nearly a half page, promoting new butane gas installations and appliances.

His new building, which he helped to construct, was planned especially to display butane appliances in the most attractive manner. The front is of ivory and black Cararra glass, with two large display windows, kept lighted at night.

Butane gas water heaters range along one entire wall, and present a direct tie-up with the advertising

aimed at people who live "beyond the gas line."

Butane ranges also have a prominent spot out front, with two capable women to demonstrate them at all times. They are Mrs. George, who assists her husband in the office, and Mrs. Blanch Choate, manager.

Mr. George likes to turn the store management over to these well-trained women so that he can reserve his own time for that part of his business—service—which aids him in fighting growing competition.

He lets his feminine aides do most of the selling and the planning of displays.

Gas Heater Display

Mass display is a favorite here, and is used for all appliances. At the height of the cold winter, which struck Arkansas with unusual fury, butane gas heaters were shown in an impressive double-tiered floor island in the middle of the store. They moved out very fast, but new models took the places of those sold.

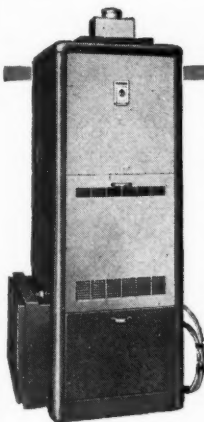
Mass display is also used for butane gas tanks, which are sometimes



One of the four service trucks used in service to customers who have bought butane gas systems and appliances.

Efficient...

that's the word for these modern heating units
by **AMERICAN-Standard**



WYANDOTTE Winter Air Conditioner — Designed especially for homes without basements, individual apartments, or as a space-saver in small basements. Has copper bearing steel heating element which resists corrosion and rust. Ample radiator is designed for efficient and enduring service. Comes in four sizes.

■ American-Standard Heating Equipment for liquefied petroleum gas has achieved an outstanding record for efficiency. Backed by research and production facilities that are second to none, American-Standard products are noted for satisfactory performance, attractive appearance, and sturdy construction. That's why they are so easy to sell...that's why they give such lasting customer satisfaction. For information about the complete line, contact your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pennsylvania.

BUDGET Automatic Storage Water Heater — Has fuel-saving cast iron blue flame burner and safety controls. Center flue with spiral baffle insures quick recovery. Mineral wool insulation between heavy galvanized steel tank and trim white enameled jacket prevents heat loss, increases efficiency. Comes in three sizes, with 20, 30, and 40 gallon capacities.



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When Arkansas weather turns cold, space heaters take the spotlight in display room.

shown in a long row on the vacant lot at the side of the store.

When a customer makes a selection of a new butane system or an appliance from the attractive display floor, he or she is always reminded about the excellent repair service that can be had at the rear.

"You won't need repairs for a long time," the customer is told. "When you do, you won't find faster, better service anywhere else in the state."

When that customer looks in the telephone directory to find the George number, she will observe that Mr. George now has a lot of competition. But Mr. George is not worrying about that growing competition which he inspired when he first began introducing butane gas to Arkansas. He is meeting competition with repair service and a beautiful new store.

Tennessee Liquefied Gas, Inc. Opens Branch in Memphis

Tennessee Liquefied Gas Inc. has established a bulk plant and distributing point at 3540 Jackson Ave., Memphis, Tenn. Other plants of the same company are located in Dyersburg and Brownsville, Tenn., according to word received from James S. Jones, manager of the company.

All the bulk plants of Tennessee Liquefied Gas Inc. have been engineered by Phillips Petroleum Co., and that firm also supplies the Tennessee company's gas.

Among other products handled are Mitchell vaporizers and J & S carburetors. There is said to be considerable interest in the Tennessee area in the conversion of tractor and truck engines to butane.

Cooperation

Keeps Gas in Front — On and Off the Mains

By H. EMERSON THOMAS*

President, Fuelite Natural Gas Corp., Westfield, N. J.

It is estimated that there are now approximately 4,500,000 home and commercial customers beyond the mains of utility companies, consuming approximately 1,000,000,000 gallons, or 920,000,000 therms a year of liquefied petroleum gas. In 1927, the average load was approximately 100 gallons per customer but in 1947 it had increased to approximately 222 gallons per customer per year.

A question probably arises in your mind as to where these LP-Gas customers are located. There are four main types:

1. Suburban homes and commercial establishments within reasonably short mileage of the gas mains.
2. Small cities and towns without gas mains.
3. Farm or rural areas.
4. Seasonal resort homes and commercial establishments.

I am going to make a guess, for

what value it may have, that the breakdown is as follows:

<i>Locations</i>	<i>Customers</i>	<i>Percent</i>
Suburban areas	1,125,000	25%
Small cities and towns	1,800,000	40%
Farm and rural	1,125,000	25%
Seasonal resorts	450,000	10%
	4,500,000	100%



H. E. THOMAS

Those of you in the manufactured gas utility end of the gas industry are undoubtedly more interested in the suburban areas beyond the mains than in the other type customers. On the other hand, the natural gas utility man is also interested in the other categories to a greater extent.

The significance of this load beyond the mains is the factor that you and I, as utility operators, are interested in. How do those LP-Gas customers and that market fit into our own individual operation?

In the first place, how do those 1,125,000 LP-Gas users in the suburban areas affect us? Also, to a lesser degree, the other 3,375,000

*A paper delivered before the Midwest Regional Gas Sales Conference of the American Gas Association in Chicago, March 29-31.

LP-Gas users? We all know that these 4,500,000 users have been sold on gas as the fuel for their kitchen ranges and in many cases, for water heating and refrigeration. Therefore, there are that many families that know and use gas, even though beyond the mains.

Movement to Cities

There is some greater trend for families to move from the heavily congested sections to the suburban areas, but in spite of this, there are going to be hundreds or thousands who, over a period of time, will move on to the gas mains. A large percentage of them will bring gas appliances with them, but in any event, they will more than likely continue to be gas users

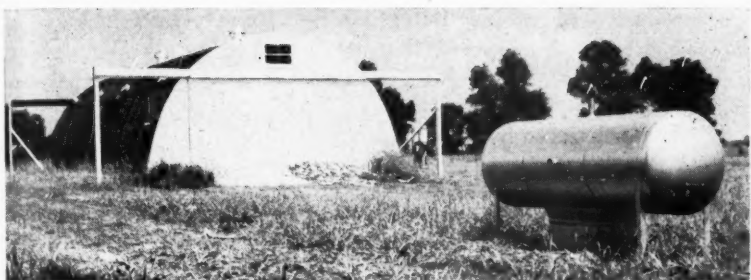
rather than to go to some competing fuel.

Thus, in the movement of American families from one area to another, we have nearly 5,000,000 gas-minded families which, without LP-Gas, would not be in this category. This number is daily increasing and their value cannot be discounted within the gas industry.

A second factor, but one which I believe is of less actual value than that covered above, is that probably 20%, or 900,000 of the LP-Gas users are close enough to present lines, either manufactured or natural, to be potential customers "on the mains." You will probably think that such a thought would be a horror to the LP-Gas operator, but it should not be so and actually is not. Why? Well, the



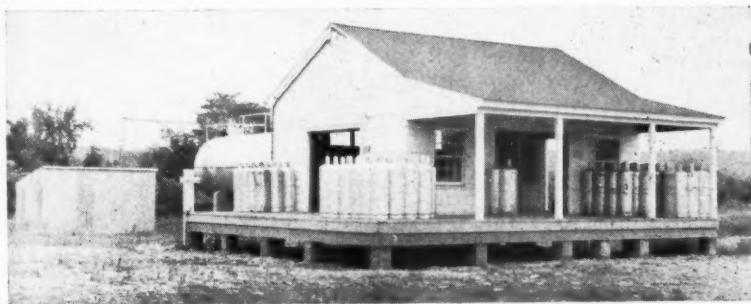
Typical appliance showroom of a LP-Gas dealer—this one belonging to Propane Gas Service Co., Erie, Pa. These appliances are identical in appearance and efficiencies to those sold by utilities in large cities.



In the Southwest large consumer tanks serve farms and commercial users. This is a "Stargas" installation near Dallas, Texas.

facts are that all such users would not be changed over rapidly, but only on a gradual basis, as the less built-up areas became quite densely populated. Also, if this happens, then there are also additional homes being built in the outlying districts, beyond the congested areas. So the LP-Gas operator has a growing market, in spite of some users being served by the utility as the mains are extended.

From the LP-Gas operator's standpoint, when this happens, he removes his equipment from one user's home, but without new capital expenditure he then has it available to re-install for a new user. Because of no capital investment in equipment for this new customer and the fact that he still charges his standard installation price, his net investment in such a customer is less than for the for-



Cylinder filling plants, such as this one owned by Rural Gas Co., Bridgeport, Conn., enable LP-Gas dealers to fill their own bottles from their own bulk storage.

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mer. He may also sell new appliances, which gives him a sales profit not possible at that time with an old customer.

A situation as outlined above shows progress in the entire area; therefore, both the LP-Gas operator and the utility gain, and more customers get modern gas service.

Utility LP-Gas Operations

Now the question arises as to the advisability of the utility itself actively carrying on the LP-Gas sales and service beyond the mains. It is, of course, impossible to answer this specifically for any given situation without all the factors that enter into a full consideration. I would say, however, that in the majority of cases, it is probable that LP-Gas is satisfactorily being served by several LP-Gas operators in any given area and that with cooperation between the utility and the LP-Gas groups, the acceptance of gas will be enhanced as the universal fuel, regardless of type. I believe the competitive aspect in the area between several LP-Gas operators will help to maintain a higher quality of service than might be the case if most of the customers were served by just one company.

In making this statement, I am somewhat talking against one of my businesses, as I am a management consultant on LP-Gas and thus might be talking myself out of potential business with some of your utility operators who are considering LP-Gas distribution beyond the mains. However, I qualified myself above, as I believe there may be cases where the utility

should market LP-Gas in their area beyond the mains.

In an analysis on such distribution, there are many factors to consider, some of which might be:

1. Area study where mains might be extended.
2. Topography of area.
3. Potential customers in area.
4. Growth possibilities of area.
5. Type of homes.
6. Type of families and economic status.
7. Present fuels being used.
8. Present distribution of LP-Gas in area.
9. Bulk storage facilities.
10. Types of LP-Gas distribution systems applicable to area.
11. Problems on price difference between "on" and "off" the mains.
12. Capital investment factors.
13. Source of product.
14. How sales setup would fit in the LP-Gas, if at all.
15. Insurance.
16. Problems where appliances are sold only through dealers.

Differences in Methods

There are many similarities in utility operations and LP-Gas beyond the mains, yet there are some very distinct differences that are not sometimes given enough attention. For instance:

1. In utility operations, the investment per customer is considerably higher than with LP-Gas, however,
2. The distribution cost on LP-Gas is materially higher than through the mains.
3. The physical distribution system of the utility is static or fixed, while

the LP-Gas physical distribution equipment is mobile and flexible in use.

4. Utility customers are generally well concentrated, while those using LP-Gas are widely scattered.

5. Because of location, individual service call costs are higher on LP-Gas.

6. The average service man, on manufactured gas, needs a complete, new training and concept of the burner adjustments on LP-Gas appliances, because of the different pressures needed to inspire the much greater percentage of air for proper combustion, different specific gravity, slower rate of flame propagation and other factors.

7. A different pricing policy because of different investment and cost of product and service factors.

8. The same appliances cannot be indiscriminately sold and used for both types of gases, except in certain cases.

9. The sales approach to the potential user has to be somewhat different "on" vs. "off" the mains.

These and other differences in these two branches of the gas industry require study and a knowledge of the similarity as well as the non-similar factors to set up a proper division for LP-Gas distribution or, on the other hand, valuable cooperation with the existing LP-Gas operators in your general area.

There are several types of LP-Gas equipment and delivery systems. In covering these, I believe there are four systems which should be studied:

A. The conventional 2-cylinder system, where the customer has one cylinder in use and a second cylinder in

reserve. An automatic changeover device may be used in this system, which allows flow from the reserve cylinder when the supply cylinder is exhausted. If a manual changeover system is used, the customer changes to the reserve cylinder. In either case, he then orders a replacement cylinder. Of course, should he neglect to order a replacement, he will run out of gas and a special delivery by the operator may be necessary.

B. A "cash and carry," or as it is sometimes called a "self-service," system. In this case, two cylinders are installed, with one for reserve. Manual changeover or automatic can also be used in going from the supply to the reserve cylinder. The main difference in this system is that the cylinders are 20 lb. capacity each, whereas the above mentioned 2-cylinder system uses 60 lb. to 100 lb. capacity cylinders. Also, in this system, the customer has to return the empty cylinder and exchange it for a full one. The design of the installation is such that the cylinder can be readily connected and disconnected without the need of wrenches and still maintain a tight connection.

C. Replaceable cylinder system with monthly billing to the customer. One or more cylinders are installed, depending upon the load consumed between regular deliveries. The regular schedule is usually 30 to 60 days, at which time the partially empty cylinder is removed and replaced by a full one. Enough gas is left at the customer location to take care of the known supply, plus a conservative surplus to take care of any excessive use. In order to keep delivery costs to a minimum on the smaller consumers, deliveries are usually made each 60 days; however, the average company gives a monthly billing to these customers, by use of an estimated bill. The consumption is deter-

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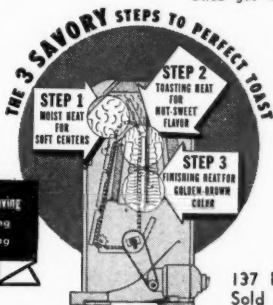
4 SAVORY is adjustable quickly and easily for peak and off-peak periods. No waiting for heat recovery.

5 SAVORY is easy to clean—inside and out. Crumbs can't collect in working parts. Lustrous, modern stainless steel resists wear and corrosion.

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mined either by weight or meter, the former being most generally used.

D. The fourth and last system is the bulk system, which uses 100 lb. to 420 lb. capacity cylinders or ASME Code tanks of from 150 gallons to 1000 gallons, with tank truck delivery. If cylinders are used, the consumption may be determined by weight, by meter or liquid level gauge; if bulk tanks are used, by meter or by liquid level gauge. In most cases, monthly billing is used.

In Table 1, I have shown the approximate cost of these systems from the standpoint of investment. There is a wide variance in investment cost per customer equipment in the various systems. The lowest is on the replaceable cylinder, monthly billing system and the highest is on the bulk system.

There are two types of installation revenue to the operator. First

and most common, is an installation charge similar to that of installing a telephone. In these cases, the equipment, including a limited amount of tubing, is loaned to the customer for use with the operator's gas. The charge generally ranges from \$19.75 to \$54.75.

Outright Sales

The second method is on an outright sale basis. Usually, this is on the bulk type system and the sale prices generally range from \$150 to \$500. On this latter, the operator usually receives a merchandising profit, whereas on the lease basis, the operator usually makes the investment in the customer equipment. There is a much larger potential market on the lease basis, as the customer charge is lower than is the case if an outright sale is made.

TABLE 1: COMPARATIVE ESTIMATED COSTS OF DIFFERENT TYPES AND SIZES OF LP-GAS CUSTOMER EQUIPMENT

Equipment	Automatic 2-Cylinder	Manual 2-Cylinder	Replace- able Cylinder	Cash and Carry Automatic	100 Gallon Bulk	250 Gallon Bulk	1000 Gallon Bulk
Containers	\$28.00*	\$28.00*	\$14.00**	\$14.00*	\$100.00	\$130.00	\$375.00
Container valves	3.60	3.60	1.80	3.20	....	....	....
Regulator Assembly	14.20	9.90	4.00	14.60	20.00	20.00	25.00
Hood and housing	3.75	3.75	2.50	....	7.50	10.00	15.00
Gauging device	....	....	....	....	2.50	2.50	4.50
Base or foundation	1.00	.60	.60	....	2.50	10.00	15.00
	49.55	44.85	22.40	31.80	132.50	172.50	434.50
Installation	10.00	10.00	9.00	9.00	25.00	30.00	45.00
Freight estimated	2.60	2.50	1.30	1.10	7.50	15.00	45.00
Piping	5.00	5.00	5.00	5.00	10.00	15.00	20.00
	65.15	62.35	37.70	46.90	175.00	232.50	544.50

Costs are based in general on 250 to 500 units per purchase. Above figures are typical and may vary in different locations. Bulk units are based on aboveground tank. Buried tanks would add to expense of installation.

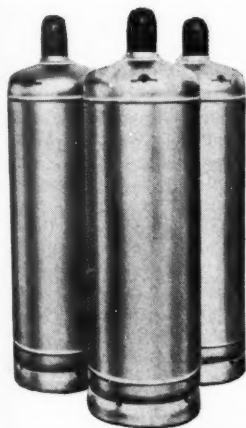
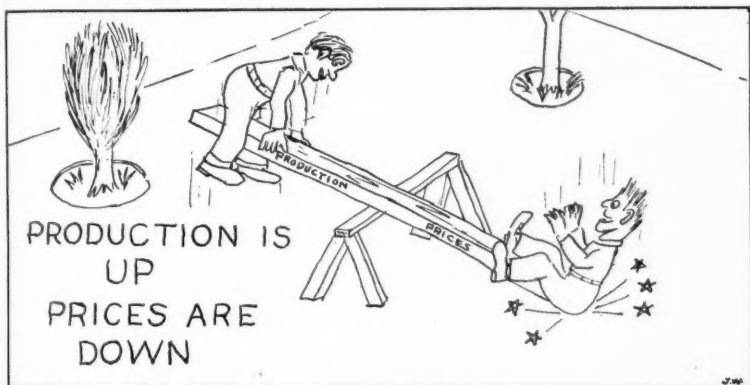
*Two cylinders

**One cylinder

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There are naturally pros and cons on each type of system, and I will give you some of these in the order that I covered the systems.

First, on the conventional 2-cylinder system, I will handle the automatic and manual as one, as they are similar except that the automatic system does not require the customer to change from one cylinder to the other.

Advantages:

a. Operator normally sells for cash, so does not have investment tied up in inventory at the customer location.

b. Medium size storage of gas on customer's premises.

Disadvantages:

a. Equipment investment higher than with replaceable cylinder, monthly billing system.

b. Monthly billing type price schedule not practical; therefore, discourages load building, as most customers prefer to receive their bills monthly.

c. The gas is usually paid for before it is used, and each payment is higher than on the monthly billing system.

d. Replacement cylinders must be ordered by customer.

e. If replacement is not ordered, customer will be completely out of gas until operator can make delivery.

f. If there is a run-out, operator has to make a special delivery.

g. Service truck has to deliver in same area several times a month.

On the cash and carry system, we find:

Advantages:

a. Lowest possible sale price for cooking load only, due to no delivery cost.

b. Applicable to seasonal business where tenants are frequently changed.

c. Medium investment in equipment.

d. Makes gas service available to locations not convenient to regular year-round truck deliveries.

e. Because customer transports own cylinders, no delivery setup is necessary.

Disadvantages:

a. Cylinder depots must be available in normal shopping area of customer.

b. Replacement must be obtained about every 24 days, as average customer uses about 300 lbs. per year.

c. It is impractical to use sliding, or step type, of price schedule, and large load would require too frequent changing of cylinders; therefore, the system is not conducive to load building.

On the replaceable cylinder monthly billing system, we find:

Advantages:

a. Continuous uninterrupted service.

b. Gas is paid for after it is used.

c. Gas is paid for on regular monthly basis, making this service similar in this respect to utility gas service.

d. Lowest investment in this type of system.

e. Customer does not need to order any gas deliveries.

f. Lends itself to load building appliance sales.

g. Regular 30 or 60 days routing can be set up on deliveries.

Disadvantages:

a. If gas use is abnormally large, using up regular supply and surplus, customer would run out.

b. Operator must carry inventory of gas at customer's location.

On the fourth and final system, the bulk system, we have:

Advantages:

a. Customer pays on a regular monthly basis.

b. Customer usually pays for gas after using it.

c. Customer has continuous uninterrupted service.

d. Customer does not have to order gas deliveries.

e. Load building appliance sales applicable.

f. Lends itself to regular deliveries once a month or less depending upon amount of storage and consumption.

g. Does away with peaks and valleys in ordering, as with proper size container, propane purchases can be made from producer throughout the year on a fairly even basis.

Disadvantages:

a. Operator must carry high inventory of gas at customer's location.

b. Investment cost is much higher per customer than with other systems.

c. If unusually large quantities are used beyond normal or anticipated needs, customer is apt to run out.

In conclusion, I would like to point out strongly that I believe, for the future of the gas industry, the utmost cooperation is necessary and advisable between the utility and the LP-Gas groups in the gas industry, in order to spread properly and completely the gospel of gas as the universal fuel, whether on or off the mains.

The LP-Gas part of the industry has grown up, it has long pants on, it has passed its pioneering stage, it no longer handles a by-product, but a major product, it is serving as bottled or tank gas approximately 20% of all the homes in

the United States that use gas, it has public acceptance, it has an excellent safety record, some highly publicized accidents to the contrary. It is an industry that is materially helping the entire gas industry to forge ahead at an increasing speed, yet on a conservative basis.

One further thought I would like to leave with you is that for our future, I firmly believe that all domestic and commercial advertising, whether private or through industry programs, should stress that gas is the fuel, whether "ON" or "OFF" the mains.

NBPA Board of Directors Meets in St. Louis

Full committee reports were presented at a board meeting of National Butane-Propane Assn. at the Jefferson hotel, St. Louis, March 18-19. John M. Robinson, president of the NBPA, presided.

Committees which met were the convention committee, Stan Beske, chairman; the safe practices committee, R. J. Coughlin, chairman; the membership committee, John L. Locke, chairman, and the auditing committee, R. N. Short, chairman.

Missouri Regulatory Authority Will Inspect Motor Fuels

The Missouri state senate on Jan. 27 passed Bill No. 179 directing that the existing regulatory authority should be deemed the "appropriate officer in charge of the collection and inspection of motor vehicle fuels in the Department of Revenue."

The Missouri law is based upon the Liquefied Petroleum Gas Association-model state law and this is an amendment to it.

Stampeding Dealers Say It Will Be Sacramento or Bust

IT'S just 100 years since the first gold seekers started overland to California and next June another cavalcade will get under way from all parts of the nation. It will be composed of LP-Gas dealers and distributors from every state in the nation en route to the historic town of Sacramento.

Not Gold, But Better?

Gold will not be the goal this time, but fun and facts will be. The fun will take care of itself and the LPGA Convention and International Trade Show will do the rest.

It's going to be a real western show, even to rope throwing cowboys and a barbecue. But there will be something better even than roast beef for dealers to sink their teeth in.

There will be a national conven-

tion with speeches and displays and there will be live exhibits of many kinds of farm, industrial and other equipment actually working on butane and propane, enabling many dealers for the first time to see in operation developments in mechanical equipment which are potential load builders for LP-Gases. Seeing this equipment in action will help dealers to determine the feasibility of soliciting such accounts in their own localities when they return home.

Will Be Two Shows in One

The first three days of the meeting will be devoted to regular convention matters, including exhibits of manufacturers of LP-Gas appliances and equipment. This will be limited to the trade. Then the gates will be open to the public for dem-



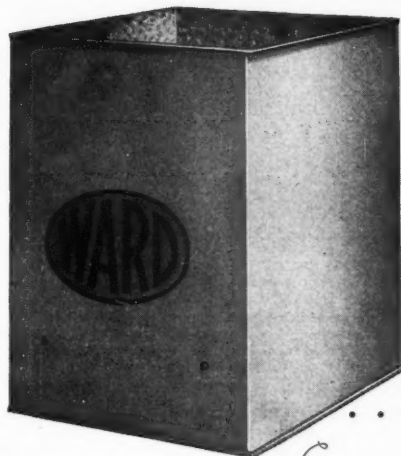
Some of the manufacturers of LP-Gas appliances and equipment who attended a Los Angeles meeting in January to hear Bob Johnson and Don McNary ballyhoo the LPGA convention and trade show at Sacramento June 1-6. Spencer Selby and C. L. Parkhill, Jr., handled the meeting.

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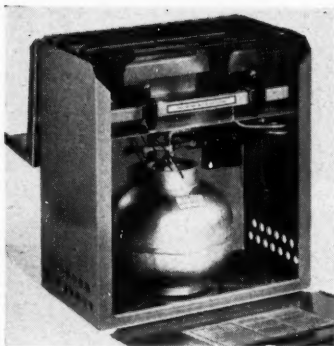
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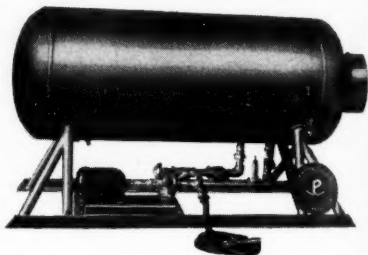
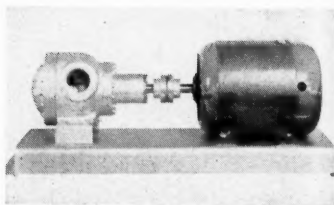
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ABOVE (left)—This portable gas stove, a product of the Holther Corp., South Gate, Calif., is likely to be in strong demand at the trade show to provide hot meals for exhibitors. It folds into a metal case for easy carrying. ICC bottle holds 1 gal. of butane or propane.

ABOVE (right)—This LP-Gas pump of Smith Precision Products Co., South Pasadena, Calif., will be seen in fuel transfer operations.



BELOW (right)—A Parkhill-Wade dispenser like this will provide fuel to trucks, tractors, stationary pumping units, brooders, weed burners and other equipment in action at the show.

onstrations of plowing with tractors, drying hay and grains with dehydrators, raising poultry under brooders, sterilizing dairy equipment, the operation of furnaces for industrial plants and air mixing machines for town plants and standbys.

Under the chairmanship of Ernie Adams, Los Angeles LP-Gas distributor and state chairman of the LPGA, the entertainment committee is also making sure that the side play will have some punch. There is a style

show planned for the ladies, a rodeo or horse races for the men, and fireworks for the youngsters.

Additional diversions scheduled are singing troubadours, personal appearances by Hollywood movie stars, the finals of cooking school championships, a radio broadcast, variety shows and movies, and a fire demonstration.

As well as a huge consumer attendance, a big showing of LP-Gas dealers is expected for the show. Bob Johnson, director of the undertaking, and Don McNary, Pacific Coast secre-

▲
Propane burning tractors will be there in force, some of them equipped with flame weed burners like this one.
▼



tary of the LPGA, traveled more than 2500 miles personally contacting 300 California dealers in February.

At least 90% of West Coast dealers, judging from the response accorded the LPGA's traveling emissaries, will be on hand. A trainload of dealers has been organized as the Oregon delegation, and according to Ernest Fannin of Phoenix, Ariz., 60 to 75 dealers are planning to attend from that state. Chartered trains from the East, South and Midwest are planned.

Women Will Be Entertained

Mrs. Tallant H. Ransome has accepted the chairmanship of the Women's committee, and has announced the appointments of Mesdames Bill Timmins, Joe Fagan, Ernest Fannin, Stew Matthews, Bill Selinger, R. W. Johnson, Ernie Adams, Herb Buehler, Otto Barrett, C. L. Parkhill, John Licata, and Wilbur Haines as a committee nucleus.

Part of this group's function will be to make the wives of LP-Gas men coming from all over the country to the show feel welcome.

The chairman of the convention committee is George Ryan, president of Ryan Ruralgas Co., Inc., Kansas City, Mo. Bob Johnson is the director of the trade show and his headquarters until June will be Room 305, Sacramento hotel, Sacramento. The office of the West Coast secretary of the LPGA is at 3743 Alameda Ave., Oakland, under the direction of Don McNary. Reservations for exhibit space or for hotel accommodations may be made with either Mr. Johnson or Mr. McNary.

The majority of the 292 booths which will house exhibits has already been sold. The complete program for the convention and the trade show will appear in the May issue of BUTANE-PROPANE News.

Plumber Opens LP-Gas Plant In Johnson City, N.J.

A. E. Morton and Son, operators of a plumbing and heating contracting business in Johnson City, N.Y., for more than 35 years, has opened a new retail store at 225 Grand Ave. which features bottled gas.

Drying Peanuts With LP-Gas Saves Losses, Speeds Deliveries

By O. D. HALL

SUBSTANTIAL savings have been brought to peanut growers of Southern Oklahoma through liquefied petroleum gas burning installations made by Troy Stone of the Stone Butane Gas Service, Durant, during the past season.

At an average cost of 10 cents per bushel for drying, the growers not only have eliminated most of the risks of losses from bad weather during harvesting time, but have realized more than 18 cents per bushel higher profits on their marketed product, to say nothing of time saved in the process of drying.

The older method of drying the crop in the sun required from 8 to 15 days if the weather were favorable and involved risks of almost total loss of the crop and inferior quality of product if bad weather were encountered.

Installation is Simple

Mr. Stone who developed the process, makes the installations on the farm. These are comparatively simple and involve a cost to the producer of from \$400 to \$700, depending on the size of the installation. All that is required is a LP-Gas tank of from 500 to 1000 gallons capacity, some pipe, a furnace-type LP-Gas burner and a blower-type fan to distribute the heat through tin or concrete-block ducts

leading from the heating unit to the drying area.

A farmer's barn or other building can be adapted for use in the drying process by installing a network of 2x4's and 2x6's throughout the floor area, leaving open spaces between them through which the heat is evenly distributed to the bags of peanuts. An average building used for this purpose ranges from 16x30 ft. to 20x40 ft. in dimensions and the drying floor is usually about 18 inches above the ground.

The peanuts in bags containing from two to four bushels each require from 8 to 20 hours for drying, depending upon the amount of moisture that was in them when brought in from the field. Where the peanuts are fairly dry at the start, as little as 25 gallons of LP-Gas will do the work of drying the average lot of 400 to 450 bushels. As high as 75 or 80 gallons of fuel are required if the percentage of moisture in the peanuts is high and temperatures in the dehydrating space under the floor at the start are below freezing or relatively low. The average is around 50 gallons of LP-Gas for completing the drying of foregoing quantities. Average temperatures are

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Specify **REGO**

REGO's Complete Line of LP Gas Liquid Level Gauges Enables You to Select the Exact Type and Size for Every Container Application

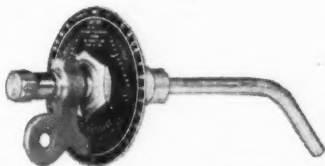
Scientifically designed and accurately constructed, RegO gauging devices are the choice of experienced LP Gas producers, distributors and dealers, because they know that RegO gauges provide the accurate fuel readings necessary in handling LP Gases.

Use of RegO gauges in LP Gas systems provides an important safety factor in helping to avoid hazards due to overfilling, and, in addition, they afford an accurate means for computing fuel inventories and determining rate of use.

No matter what type, size or shape container is used, there is a RegO gauge specifically designed to provide easy, safe and accurate readings. Complete details on the design, construction and operation of RegO gauges will be found in RegO Catalog Section LJ.

REGO ROTOGAGES

Contents of cylindrical or spherical containers, in stationary or mobile installations, may be quickly and accurately measured with the RegO Rotogage. This gauge is suitable for end or side mounting and is furnished in two sizes. The small size is for use on stationary containers up to 60" in diameter, or for mobile fuel tanks up to 24" in diameter. The large size is designed for use on stationary bulk containers greater than 60" in diameter or for mobile fuel tanks greater than 24" in diameter.



Patented

The **BASTIAN-BLESSING** Company

4201 West Peterson Avenue

Chicago 38, Illinois

REGO
LP GAS EQUIPMENT

PRECISION EQUIPMENT FOR USING AND CONTROLLING LP GASES

maintained at 100° throughout the dehydrating space during the process.

With employment of older methods of drying the peanuts in the field, about 9 or 10 days are required under favorable weather conditions. Mr. Stone says that in many instances the peanuts have been dug, and made ready for the market through use of LP-Gas drying in as few as four or five days. Under these time saving methods a greater yield and better quality of hay is also realized.

Some Do Custom Work

Some 9 or 10 growers who installed the drying equipment under the direction of Mr. Stone last season, not only dehydrated their own crops but did custom work for their neighbors, making net returns as high as \$7 per day and realizing sufficient income from the enterprise to more than pay for their equipment.

In the Durant area, alone, from 80,000 to 100,000 bushels of peanuts have been dried by the LP-Gas process, Mr. Stone estimates.

Bupane Gas Co., of Iowa, Installs Plant in Illinois

The Bupane Gas Co., whose main plant is at Cedar Rapids, Iowa, in order to better serve its dealers in the north central Illinois area, has recently completed a new sub-plant at Peoria. This makes the third plant operated by Bupane, there being another one at Mapleton, Iowa.

The Peoria plant consists of a 24x40 full-basement, concrete block, office building, a 30,000-gallon tank and a concrete block fill house. The basement of the office building is used for a service room and for warehousing of ranges. A small part of the first floor is devoted to displays of ranges, refrigerators and water heaters. R. C. Lee is manager.

The opening of the new plant was announced by a half-page ad in the Peoria papers. The ad listed 38 Bupane service agencies and dealers in gas appliances in the territory. Eighty-four additional appliance dealers who can give complete information on Bupane gas home conveniences were also given, indicating the intensive distribution facilities developed by the company.



The new Illinois plant in Peoria of the Bupane Gas Co. of Cedar Rapids, Iowa.

This Year —

Combine Pleasure and Profit

VISIT LPGA'S CONVENTION AND INTERNATIONAL TRADE SHOW AT SACRAMENTO, CALIFORNIA

Yosemite



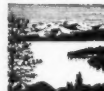
Redwoods



Mather Lodge



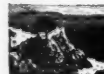
Lake Tahoe



San Francisco



Carmel



The first annual LP-Gas International Trade Show is being held in Sacramento, California, on June 3, 4, 5 and 6, following the L.P.G.A. National Convention. Plan now to break in your new car on a trip to California, which can be of much interest and profit to you, and be thoroughly enjoyable to your wife and family.

It is not necessary to be a member of L.P.G.A. to visit the show or to exhibit your equipment and appliances. An invitation is extended to all who have a mutual interest in LP-Gas, Natural or Manufactured Gas.

After the show closes, take the time to enjoy the natural beauties which alone attract tourists by the millions. Attend the show staged in a natural vacation land, enjoy the hospitality of people who are anxious to show you California and the great Pacific Northwest.

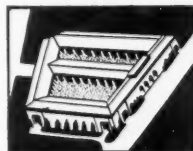


Bob Johnson, Director



Governor's Hall

One of the fine buildings on the State Fair Grounds seats 1500 persons, and will be used during the show for the cooking school, and for entertainment features and attractions.



Machinery Hall

This building, with 64,000 sq. ft. of Indoor Display Space, and 80,000 sq. ft. of Outdoor Display Space, will house the multitude of exhibits portraying "LP-Gas in Action."



Sacramento, California.

LP GAS INTERNATIONAL TRADE SHOW
3743 ALAMEDA AVENUE OAKLAND, CALIFORNIA



A busy day at the Detroit Yacht Club, Detroit, where LP-Gas with Garland equipment is used to prepare an average of 1000 meals per day.



A corner of the auxiliary kitchen in the yacht club.

Thinks LP-Gas OK After 25-Year Test

THE installation of additional liquefied petroleum gas equipment at the famous Detroit Yacht Club, Detroit, recently served to remind many of the old timers in the industry that this club is one of the first of America's finer clubs to make use of LP-Gas for cooking purposes.

The club was built 25 years ago and has utilized LP-Gas throughout its existence.

Natural gas, piped from Texas, serves the city of Detroit. But the Detroit Yacht Club is built on a man-made island in the Detroit river, three miles from the downtown city and adjoining Detroit's well known island park, Belle Isle.

The Detroit Yacht Club averages 1000 meals a day throughout the year, seven days a week. It is the scene of almost continuous parties during afternoons and evenings. Among the trophies won by its members are the Gold Cup, Silver Cup, Harmsworth Cup and other famous trophies known to yachtsmen throughout the world.

Main Kitchen Equipment

Garland equipment, made by the Detroit-Michigan Stove Co., is used exclusively throughout the club. In the main kitchen are one open top, one griddle top and two hot-top Garland ranges as well as two large Garland boilers.

Equipment provided in the auxiliary kitchen was made up of an open top range, one combination broiler, toaster and griddle, and one ceramic broiler.

Twenty 100-pound cylinders are installed 50 feet from the main building, and about 250 feet from the gas appliances. Gas consumption is approximately 50 cylinders per month.

Roy M. Shilson, manager of the



A battery of Garland equipment in the main kitchen of Detroit Yacht Club.

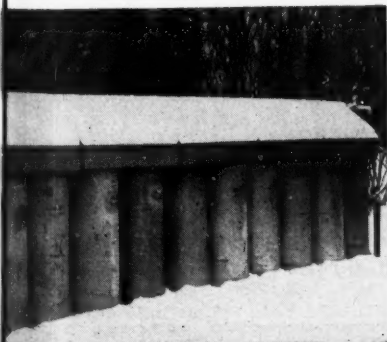
club, pleased with the operation of Garland equipment on bottled gas, states that it is doing the job well and at a reasonable cost.

The installations were made by Reichle Sons Co., of Detroit. Equipment is serviced by Michigan Suburban Gas Co., Royal Oak, Mich.

N. J. Standard Changes Name To Esso Standard Oil Co.

The name of the Standard Oil Co. of New Jersey has been changed to the Esso Standard Oil Co., it has been announced by M. J. Rathbone, president of the company.

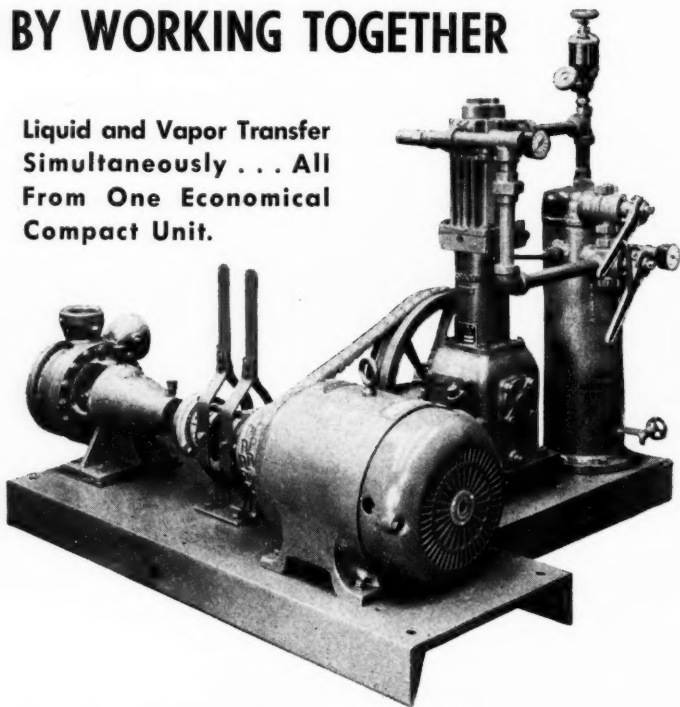
The change was made to give formal recognition to the close association which has developed in the public's mind over a period of years between the corporate name of the company and its Esso trade-mark.



Installation of gas cylinders for kitchens of Detroit Yacht Club. Gas consumption is approximately 50 cylinders per month.

SERVES YOU BETTER BY WORKING TOGETHER

Liquid and Vapor Transfer
Simultaneously . . . All
From One Economical
Compact Unit.



Available in ALL SIZES to meet the requirements of Your
Bulk Plant. Write for our new literature and prices on
Vapor and Liquid Pumping Units.

CORKEN'S

L-P GAS EQUIPMENT DEPT.
206 East Grand
Oklahoma City, Oklahoma

Seeing Your Business Through Business Records

By MARSHALL MASSEY

Director of Research, Ross-Martin Co.
Tulsa, Oklahoma

THERE may be some pitfalls in a butane-propane dealer's business, but the worst one is, "Failure to recognize your business as it really is."

It is too easy to let excessive delivery costs, cash and stock shortages, and unsatisfactory service pile up to where they cause deficits. While you hope and dream that next month or next year everything will be all right, those deficits are eating up your working capital.

You may say, "I see what is going on in my business—I'm on the job 16 hours a day, seven days a week—nothing escapes me."

Sure, you see the unloading and storing of gas and appliances—you see trucks loaded and started on routes—you see sales made to customers and complaints received. But do you see them as they really are? What you see represent only the jig-saw details which have to be pieced together before you can get



M. H. MASSEY

a clear and accurate picture of what effect they may have on your business. Besides, so many things happen that it is impossible to rely on your memory to produce a picture showing whether they worked favorably or unfavorably to your business.

The only way to see things as they really are in your business—that is, whether they are happening to help you toward or are pulling you away from your Profit objective, and see them in time to take any necessary corrective action, is to record them as they happen.

Business records are the "memory on paper" of your business, your books. Nearly all business

The business forms for LP-Gas dealers, described in the accompanying article, are the result of months of research into industry needs made by the National Butane-Propane Association, under the direction of Executive Vice President Elwin E. Hadlick, and the Ross-Martin Co.

The NBPA, besieged by dealers who had no established forms to guide them in handling their accounting systems, decided to survey industry needs in order to obtain forms which would be most universally helpful.

The Ross-Martin Co., long experienced in similar activities, joined in this survey and the result is told herein.—Editor.

DELIVERY EXPENSE RECORD									
MADE ON MODEL OF EQUIPMENT									
MONTHS OF									
EQUIP. NUMBER									
OPERATING EXPENSES									
DATE	MILES DRIVEN	GALLONS DELIVERED	FUEL	OIL	TIRE	MAINTENANCE	REPAIRS	RENT	OTHER
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
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25									
26									
27									
28									
29									
30									
31									
TOTAL									
DEPRECIATION ON EQUIPMENT FOR MONTH									
INSURANCE FOR MONTH									
ADDITIONAL COMPENSATION FOR MONTH									
TAXES FOR MONTH									
TOTAL FIXED EXPENSES FOR MONTH									
TOTAL ALL COLUMNS ABOVE									
TOTAL FIXED EXPENSES FOR MONTH									
TOTAL COST TO OPERATE EQUIP. FOR MONTH									
AVERAGE COST PER MILE DRIVEN									
AVERAGE COST PER GALLON DELIVERED									

PURCHASE ORDER

Acceptor 45 TOTAL PRINTING CO.

ISSUED TO NAME OF BUYER DATE

STREET ADDRESS

CITY AND STATE

QUANTITY

SHIPPING INSTRUCTIONS

USED AT LOCATION

USED FOR

JOB NUMBER SIGNED

EMPHASIS A "THIRTY-TO-ONE" PURCHASE ORDER

THE ROSS-WORTH COMPANY IS A DIVISION OF THE MID-WEST PRINTING COMPANY

MAIL COPIES OF YOUR INVOICE SHOWING THE NUMBER OF THIS PURCHASE ORDER NO.

ISSUED BY NAME OF PURCHASING COMPANY

STREET ADDRESS

NAME OF CUSTOMER

BY

DATE PAID	AMOUNT PAID	OIL LEFT	DATE OF NEXT FILL	DATE PAID	AMOUNT PAID	OIL LEFT	DATE OF NEXT FILL

CUSTOMER SCHEDULE CARD

Forms 1, 3 and 4.

men consider record keeping a nuisance and a chore. It is only natural to shy away from the amount of detail involved and to avoid facing unpleasant facts which sooner or later turn up in any business. Records and account books often are considered plain drudgery to be

avoided at all costs. And they are! They are avoided at the ultimate cost of failure.

Until 1940, 50% of small businesses that failed kept no records whatever. Eighty percent made no effort to learn even the elementary phases of management. They pre-

ferred to learn the hard way—by losing.

From information gathered by the U. S. Department of Commerce, the astounding fact was unearthed that 28 out of 30 businesses which failed in Missouri lost out because they had faulty business records, or none at all. Their study also showed that 73% of 494 business concerns in one area had inadequate record keeping systems.

This is not to say that those concerns which failed, or even those which had inadequate systems, were ignoring the keeping of records, but rather, were using incomplete records or not properly using the facts which records are designed to provide. The chances are that every one of the 28 business men out of 30 who failed could honestly say to himself: "I see what is going on in my business. I keep records showing cash income and outgo." And yet 28 out of 30 could not stay in business! Why?

Need Basic Information

To stay in business you must have hard, up-to-the-minute facts that will help you in making a profit and in planning for expansion of your business. It is not enough to know how much money you take in and how much you pay out. The bank account is frequently mistaken for a thermometer of prosperity. There are any number of possible combinations in which this may not be true.

Frequently an expanding business with mounting profits has a bank balance much too small for its needs; while the cash balance may fail to reveal a declining busi-

ness. The stock may be growing smaller or the investment in trucks and plant equipment may be deteriorating, while cash remains fairly constant or fails to increase rapidly enough to offset the loss of these other assets. The average butane-propane dealer needs such facts about his business, as:

1. The amount of business done; the amount of cash sales and charge sales applying to butane-propane appliances, etc.

2. The margin of gross profit earned on each item sold.

3. The amount out of each dollar of sales absorbed by operating and overhead expense.

4. The net profit earned.

5. The amount of income tax.

6. The net worth—the amount of proprietorship in the business.

7. How the business is progressing from month to month and year to year as shown by trends in sales, expenses, net worth, etc.

8. The stock (inventory) on hand.

9. Turnover of inventories — the rapidity with which stocks are bought and sold.

10. How much customers owe and the economy and efficiency with which capital tied up in accounts receivable is handled—the number of average day's sales outstanding in accounts receivable at close of each month.

11. How much money is owed suppliers and others.

12. Whether the cash in the bank is sufficient for expanding the business, replacing worn out equipment, etc.

13. The extent to which the current assets exceed the current liabilities.

14. How the business compares with the business of other dealers.

In addition to the facts which

NUMBER 513 WEEK BEYOND US
TUESDAY, 1993-09-08

Form 2.

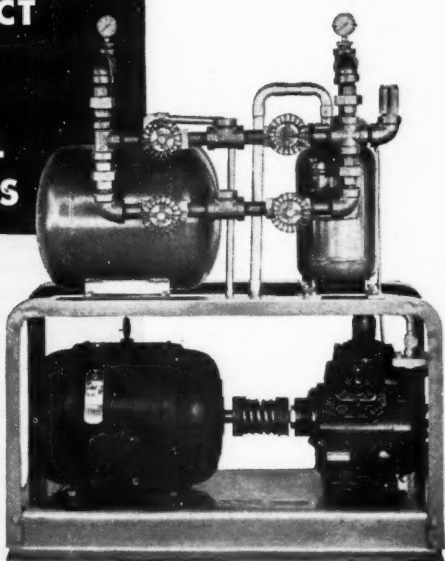
BUTANE-PROPANE News

NEW COMPACT

Roney DIFFERENTIAL COMPRESSORS

Perform More Operations Than a Liquid Pumping Station

Direct shaft connection & space-saving arrangement of motor, compressor, tanks and piping make the Roney Differential Compressor easy to handle.



Perform all types of fluid unloading, loading, filling and raising jobs quicker, easier and cheaper. The Roney way is economical. From each tank car unloaded, a Roney Vapor Differential Compressor saves up to 250 gallons of gas now lost in liquid pumping systems.

Roney Differential Vapor Compressors are available in three sizes with fluid transfer rates from 40 gpm to 400 gpm. Write today for complete information. Early deliveries assured.

Bulk Plant layouts
mailed on request.

ECONOMY FEATURES OF RONEY DIFFERENTIAL COMPRESSORS

LOW INSTALLATION COST
NO VENTING LOSSES
DURING FILLING
SIMPLIFIED PIPING
ASSURED RECOVERY OF
RESIDUAL VAPORS

L.C. RONEY INC.

3711 S. Redondo Blvd., Inglewood, Calif.

2. Support requests for loans.

3. Provide claims and establish claims in the case of loss or destruction of property—evidence in courts of equity for assistance in recovering property.

4. Show the business to good advantage in the event of desires to dispose of it.

The right kind and proper make-up of the forms you use to record the facts about your business are just as necessary as the facts themselves. Your business will function more smoothly, more efficiently and more profitably when you use business forms tailored for your specific need. Forms are the tools used in clerical work the same as hammers, saws, and wrenches are used in physical work. A carpenter would not think of using a chisel to drive a nail, but it is not uncommon to find business men recording valuable facts on envelopes, or the back of checks, instead of on a form designed for the purpose. Bookkeepers at good salaries are too often required to use blank pieces of paper instead of well designed forms to record the great variety and large volume of important facts.

Such practice is false economy since the cost of the paper and printing involved in the form required usually amounts to only a few cents. But the labor cost of filling in the same form runs into dollars. Individuals who fill out forms are paid about 17 times as much as the cost of the materials with which they work. This emphasizes the importance of using forms designed especially for the butane-propane business.

A 10-month study of the form requirements for the butane-propane business has just been completed by the Ross-Martin Co., Tulsa, Oklahoma. An experienced accountant and a management engineer with 25 years' experience in the oil and gas industry, studied forms used by dealers over the entire United States. Trips were made from one state to another to see dealers, small and large, in action. Every ache and pain suffered by the industry was examined. Dealers were talked to who were making substantial profits year-in and year-out. Before leaving them, they gave some of their secrets for making profits year after year. Hundreds of forms were examined. Scores of problems peculiar to the industry were studied.

Committee OK'd Forms

Then this mass of material was pieced together and shaped into improved tools (business forms), which any dealer can use in his everyday operations. A committee of distributors examined the new forms with a practical operator's eye, and approved them for industry use. Every effort has been made to avoid giving a dealer something that is impractical or too technical for his use.

It was evident very early in the study, from information obtained from dealers and examination of forms, that delivery expense was one of the worst booby traps for the dealer. Delivery expense was silently but rapidly eating away the profits. Some dealers saw their trucks rolling constantly and thought they were in operation to

make a profit, but when they saw them through the delivery expense record (see Form 1) they found that they were putting a lot of money into motor fuel, tires, repairs and a driver's salary to make a truck roll great distances for a few deliveries and for small gallonage.

Such dealers knew that the more gallons of fuel that could be delivered for each mile driven, the less would be the cost of delivery per gallon. But they didn't know that their delivery expense was out of all proportion to the number and volume of deliveries made until they saw it as it really was—through the picture that the delivery expense record gave them. They

also saw that they would be money ahead if they had traded some of their old delivery equipment for new, instead of continuing to stand high maintenance costs on worn-out equipment.

Orders Given Loosely

Many dealers were found carrying on "verbal operations." They simply told someone to "make an installation," "make repairs" or a "routine check" at a given location. There were no specific instructions as to the nature of the work to be done or the materials to be used. No information was given as to the type or kind of appliances installed, the number of outlets, whether or not the customer would be at home at the time work was ordered to be done. Provision was not made for assembling the costs of the job as to material and labor used.

As a result, such dealers forgot to charge for some items of material or labor. Lack of information as to the nature of service desired or material needed required unnecessary trips. Not finding customers at home caused extra trips. Failure to charge enough for materials used because records of materials were kept on pieces of scratch paper was costly. In short, the total cost was not recorded on proper form. The work order form, illustrated as Form 2, has been designed to help dealers change from a "loss" to a "profit" in handling installation and repair work.

While most dealers were found to be very careful about writing out a sales slip or ticket for each sale, they were not writing pur-

ORDER DELIVERY SLIP								
NAME OF CUSTOMER				ROUTE NO.				
ADDRESS								
HOW TO GET THERE								
CAPACITY OF TANK				LOCATION OF TANK				
DATE	MILEAGE		GALLONS SOLD	DATE	MILEAGE		GALLONS SOLD	NAME OF CUSTOMER
	BEFORE	AFTER			BEFORE	AFTER		
								ROUTE NO.

Form 5.

[illegible]

Forms 6, 7 and 8.

chase orders for purchases. An old business axiom is "Well Bought Is Half Sold," which means that your sales will be more profitable if reasonable care is given to purchasing.

Where purchase orders are not used, losses can result from wrong pricing, either through error or at rates other than those agreed upon. Merchandise of quality inferior to that agreed upon can be delivered, wrong items and wrong quantities can be substituted.

The purchase order illustrated as

Form 3, specifies the exact quantity, quality, description and price of each item ordered. It will provide a record of purchase so that the order will not be duplicated before arrival of the item ordered. A copy of it will serve as a receiving report when the item arrives, and will preclude payment of the invoice before the item has been physically checked for conformity with specifications and the quantity and price on the invoice checked with the quantity and price of the order.

The use of purchase orders assures that payment of an invoice will not be made twice, and that capital will not needlessly be tied up in inventory because of duplicated orders.

If bus transportation companies allowed their buses to travel over a city, picking up those passengers who happened to want transportation at the time the bus passes their residence, they would be out of business within a few months. Instead, they select heavy-traffic routes; they put each bus on a time schedule.

Watch Delivery Costs

The butane-propane dealer faces a similar problem in making his deliveries. How well he routes and schedules his delivery equipment will determine the profitability of this part of his business.

The customers' schedule card, illustrated as Form 4, and the driver's route card, illustrated as Form 5, are tools shaped to help a dealer reach each of his customers at scheduled times without expensive backtracking.

A customer's schedule card is set up for each customer. From information on the card as to when the tank was last filled and the rate of consumption, scheduling of refill can be determined.

Drivers' route cards are filed by customer's name. As the customers' schedule cards are pulled each day for those customers requiring refills, the corresponding route cards are likewise pulled. The route cards are given to the tank truck salesman who can then plan the most economical trip to service the customers on that route for that day.

The route cards given to the tank truck salesman will be the only deliveries he will be concerned with for that day.

The salesman keeps the route cards in his possession until he has entered on the card the date, measurements, and number of gallons delivered. He then returns them to the office where they are again matched up with the customers' schedule cards and the information covering the delivery is transferred to the schedule cards. A new refill date is determined and the schedule card is then filed under the newly scheduled refill date. The route cards are returned to their file maintained in alphabetic order of customer's name.

Customer Records Important

The more a dealer knows about his customers, the more effectively and profitably can he serve them. The study of this subject revealed that while dealers know many of their customers, where they live, and whether or not they had been sold appliances, business had increased to the point where customers were so numerous that it was difficult to remember exactly the type of appliances they were using, the size of their storage facilities and the history of the deliveries of gas to them.

As a consequence, the customer record, illustrated as Form 6 was designed to care for this need. In addition to furnishing the dealer information about each customer as to type of appliances used, installation date, record of deliveries, storage capacity, etc., the customer record will prove invaluable in

planning sales campaigns, and provides an excellent mailing list for direct mail advertising. By keeping hard facts about his customers at his fingertips, instead of relying on guess work, a dealer can accomplish a better all-around management of his business.

It is impossible to rely on memory to determine which customers have cylinders and the particular cylinder numbers in their possession. A search for such information without an adequate record is expensive to the dealer.

Two cylinder record forms, illustrated as Form 7, and cylinder record, Form 8, will provide all required information about cylinders promptly. One cylinder record form is maintained and filed in numerical sequence of cylinder number. This file is referred to whenever the question arises, "Which customer has it?"

The other cylinder record form is maintained and filed in alphabetical order of customer's name. This record is referred to when the dealer wants to know, "Which cylinders does John Doe have in his possession?"

Other Forms Available

Other operating forms have likewise been designed for the especial use of and with particular advantages to the butane-propane dealer, such as, several types of sales tickets, invoices, daily sales reports, orders, etc.

In addition, the Ross-Martin Co. has prepared a record-keeping guide for the butane-propane business. A list of all the accounts to be used, together with an explana-

tion of each account, instructions for preparing a balance sheet, profit and loss statement, and explanation for filling in information on each form, are included in this guide. Its preparation has been directed more particularly to the needs of the larger dealers and distributors.

Quick Glance Reveals All

For the smaller dealers there has been prepared a simple, 30-day record book. It contains a form for each day in the month for entering results of daily operations and transactions. It is an abbreviated form of the record-keeping guide. It is so designed, that with a few minutes spent each day recording the essential happenings in the business, a dealer will know at all times how his business stands.

While it is human to prefer the more active and exciting phases of the business, as calling on customers, selling appliances, and making deliveries, some one has to keep the score on your business. Some one has to translate facts and figures into plans and action for new business. Naturally that person has to be you.

The details you handle in keeping your records are clues. The more you know about them, the more profit you can make and the better you are able to plan ahead. Business records warn you well in advance if anything is getting out of balance. They are your sources of facts and performance. They indicate what and where corrective action is needed. The "how" of such action is up to your own initiative.



Propane Powered Pants Presser Pampers Patrons



In days gone by, boys and girls would run out the door and scamper down the street after the ice cream man. Now their Dad, waving his trousers in the air, may be able to lean out the window and page a propane-fueled pants presser.

Yes, according to a communique clipped from the Winnipeg, Canada, "Free Press" by managing director H. Alty, of Home Gas Ltd., Winnipeg propane dealer, a company is about to put a mobile pressing plant on the city streets, equipped with all the necessary gear to turn wrinkled, baggy pants into razor-edged beauties.

While some of the Winnipeg aldermen seemed a little dubious about the whole thing, the safety committee gave the new concern its blessing so far as safety measures are concerned. This was after Fire Chief David Clawson stated that the use of propane gas for the purpose of furnishing fuel to a small boiler which would generate steam for the

pressing machine, would not prove a hazard.

Because a license must be obtained to operate the mobile truck-drawn unit, the matter has yet to get the approval of the city health committee. The board of fire underwriters must also agree to the arrangement.

Whether the trailer is equipped with a barrel for pedestrians who suddenly decide to have their pants pressed, was not revealed. It is a revolutionary application of LP-Gas, however, that may spread throughout the United States as well as Canada.

One Winnipeg alderman didn't think the city should encourage such a business, declaring that streets are already badly congested. Another alderman, on the other hand, reminded that hundreds of citizens only have one pair of pants, and in the past had to stay in bed while their trousers were away being pressed. The new unit would be a rare blessing to such citizens, he mused.



Fusing Plastics With Butane

BUTANE, for low and medium temperatures with plain air, and for high fusing temperatures with oxygen, makes possible the fusing of metals and plastics, or glass for the coating of many different kinds of surface in the "Glaspray" process. This process was developed by Glaspray Process Co., Inc., San Francisco.

The heart of the process is the newly invented flame spraygun, which was originally intended to fuse colored coatings and pattern lines on mosaic work in an ornamental glass plant.

Then it was called into service to mend a crack in a large glass container which was irreplaceable. With butane it was possible to bring the temperature of the adjacent area up to just below melting point gradually.

Fuel-Air Mixing

Changes in fuel-air mixing characteristics make possible a regulation of temperature, at the fusing point, ranging from a low of 150° F. to 1900° F. However, above 1100° it becomes necessary to switch the mixing line from air to oxygen.

By designing proper nozzles it was found possible to spray on materials from certain wax formulas, at the lower temperatures, to lead, glass and zinc in the middle range, on up to nickel, chromium, and

By EMMETT BRIGHTWELL



Glaspray operator making overhead application

even iron, toward the upper range of 1900°. Among these materials are included such insulators and protective coatings as polythene, polystyrene, thiokol and plain glass.

It has been found that polythene, among the plastics, approaches the

ideal for coating wine vat interiors. It has been found to be chemically inert, odorless, tasteless, insoluble, capable of retaining its form at both extremely high and extremely low temperatures, comparatively speaking.

No Residue Left

And using butane as a fuel with which to apply it, there is left no residue of alien chemical deposits, resulting in a clean, smooth, polished elastic surface which neither checks nor cracks.

The butane-fueled Glaspray coating units, extremely portable, are now being employed by wineries in

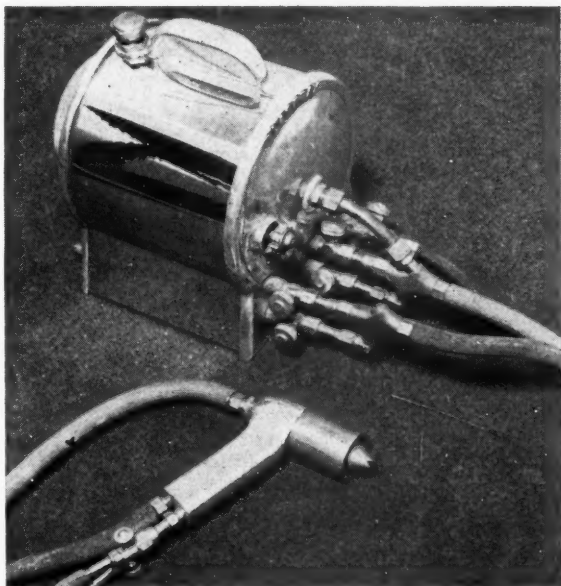
the Lodi, Calif., area for lining vats to be ready for the new wine season.

Coating Permanent

The coating with polythene, according to W. E. Schlink, president of Glaspray and formerly the owner of two wineries, is permanent, facilitates easier cleaning of the vats, and enables the vintner to exercise greater control in producing wines uniform in excellence and type.

Without butane as a fuel, the Glaspray process in this and many other applications, on account of prohibitive costs, would be next to impossible.

▲
Glaspray unit which, with butane fuel, fuses metals, plastics and glass to appropriate surfaces.
▼



ASSOCIATIONS

NBPA Issues Compilation Of All LP-Gas State Laws

The proposed publication by National Butane-Propane Assn. of the state laws and regulations relating to butane and propane gases has now been completed.

The publication covers all laws and regulations of the states of the United States and the provinces of Canada which are known to have regulations. It is mimeographed on letter size sheets and is in loose-leaf form so that it can be kept up to date as additional laws and regulations are prescribed or changed.

The publication is keyed primarily to Pamphlet 58. In some instances the law and regulations for a particular state have been covered in a single page because Pamphlet 58 had been adopted in its entirety. In other cases reference is made to the variances between the regulations of a particular state and those of Pamphlet 58. In some few cases there is such a wide discrepancy between the set-up of Pamphlet 58 and that of an individual state that the entire regulations of the state are reproduced.

The publication is copyrighted and the information is up to date as of Jan. 1, 1948. It is offered to members of the Association on a subscription basis which includes the original booklet and loose-leaf supplement service for the year 1948 at a total price of \$25, payable on order. The publication will not be sold to anyone not a member of the organization.

This is a non-profit publication and purchase of the compilation is not recommended by the Association except to those companies who operate in a number of states where there are laws and regulations and who can benefit by being assisted in determination of the laws and regulations.

North Central District

Among speakers heard at the North Central District meeting of the LPGA in Chicago, April 1-2, were four authorities from outside of the LP-Gas industry. Presentations on industry subjects were also made by LP-Gas men.

The material presented by those in related fields, however, was especially revealing to the attendance on hand. They were:

"The Business Outlook," by Arthur Babson, internationally known economist and publisher of "Babson's Reports."

"Learn to Sell Again," by J. R. Ozanne, nationally known merchandising counsel.

"The Rural Market Potential," by Paul Johnson, editor of the "Prairie Farmer."

"How to be Happy," by Charles Milton Newcomb, pioneer in industrial

All organizations serving the liquefied petroleum gas industry are invited to send to this department notices of forthcoming meetings and reports upon such meetings after they have occurred.—Editor.

relations and editor and lecturer.

Other speakers:

C. R. Crippen, who presented a "safety clinic" at which safe practices in bottled gas installations were discussed; Vernon Beals, James Gorton, and John Pankow formed the panel on the sales promotion forum, and W. A. Schuette presided over the marketers' forum. A supply clinic, during which reports of the availability of LP-Gas and steel were presented, was also held.

Exhibitors put on a friendship party, as well as a trade show.

CNGA

Dates have been set for the annual June frolic and the 23rd annual fall meeting of the California Natural Gasoline Assn., according to F. J. Colton, CNGA president. There will be an all-day sports event program and dinner and evening show, as in former years.

The frolic will be held at the Rio Hondo Golf club, Downey, Calif., June 5, and the fall meeting is scheduled for the Ambassador hotel, Los Angeles, Oct. 8.

NGAA

Three LP-Gas experts took part in the program at the annual convention of the Natural Gasoline Association of America, March 24-26, in Ft. Worth.

Z. C. Ambrose, vice president of Southwest Gas Producing Co. Inc., Monroe, La., told delegates in general session how to get "More Propane for Less Money." It was the story of a new plant designed for high pressure operation to produce maximum propane at low cost.

"Ethane in LPG and in Chemicals," was the subject handled by G. L. Brennan, Warren Petroleum Corp., Tulsa, and J. E. Bludworth, consultant, Corpus Christi, on a forum for

executives and technical men. They were part of the panel of experts.

The announcement of the winner of the Hanlon Award will appear in the May issue of BUTANE-PROPANE News.

State Associations

Nebraska

The Nebraska Liquefied Petroleum Gas Association will hold its annual convention at Liderkrantz Hall, Grand Island, Neb., April 29-30.

It has been arranged to have display booths for manufacturers to show their appliances and equipment at this meeting.

The Hotel Yancey has been designated official headquarters for the meeting and room reservations should be made directly with that hotel in Grand Island.

Those who want additional information or who wish to contract for exhibit space should write to Fremont Myers, executive secretary of the association, at 628 Keyline Bldg., Omaha, Nebraska. His phone number is Atlantic 8248.

Colorado

LP-Gas dealers planning to attend the annual national convention of the LPGA at Sacramento the first week of June, are invited to drop in on the May 22-24 meeting of the Colorado LPGA at Glenwood Springs.

The Colorado fishing season opens May 25, so as well as taking in the association's spring meeting, California-bound dealers may find time for a little rod and reel recreation.

G. B. Gelling, LP-Gas & Appliance Co., Glenwood Springs, is chairman of the Colorado meeting committee. He points out that the spring convention has been called so

CALENDAR

- April 14—Louisiana Butane Dealers Association.** Jung Hotel. New Orleans.
- April 12-13—Florida Liquefied Petroleum Gas Association.** Sheraton Hotel. Daytona Beach.
- April 19-20—Florida LP-Gas Association.** Spring Conference. Daytona Beach.
- April 21-22—Kansas LP-Gas Association** Annual Convention and Trade Show. Broadview Hotel. Wichita.
- April 29-30—Nebraska LP-Gas Association** Annual Convention and Trade Show. Hotel Yancey. Grand Island, Nebraska.
- May 10-13—National Fire Protection Association.** Hotel Statler, Washington, D. C.
- May 22-24—Colorado Liquefied Petroleum Gas Association** Spring Meeting. Colorado Hotel. Glenwood Springs, Colo.
- June 1-6—Liquefied Petroleum Gas Association** Annual Convention and International Trade Show. State Fair Grounds, Sacramento, Calif.
- June 2-4—Third Annual Short Course in Gas Technology (Natural Gas).** Texas A & I College, Kingsville, Texas.
- June 2-5—University of Tulsa LP-Gas** Short Course. Tulsa, Okla.
- June 27-30—Texas Butane Dealers Association.** Stephen F. Austin and Driskill Hotels. Austin, Texas.
- June 28—Michigan Liquefied Petroleum Gas Association.** Ramona Park Hotel. Harbor Springs, Mich.
- Sept. 12-14—Oklahoma LP-Gas Association.** Skirvin Hotel. Oklahoma City.
- Sept. 16-18—National Petroleum Association.** Atlantic City, N. J.
- Sept. 20-22—National Butane-Propane Association.** National Convention and Trade Show. Congress Hotel, Chicago.
- Sept. 26-28—Colorado Liquefied Petroleum Gas Association** Annual Meeting and Trade Show. Shirley-Savoy Hotel. Denver.
- Oct. 4—AGA Convention and GAMA Exhibition.** Atlantic City, N. J.

association members won't have to wait until next fall to discuss current industry questions.

Meanwhile, Colorado association members have just about completed organization of district meetings. Three sections, the San Luis Valley, the Western Slope, and the Arkansas Valley districts, elected officers during the past month to bring to eight the number of districts organized.

Odell Warren, Community Gas Co., Monte Vista, was host for the San Luis Valley meeting, and Steve Pearce, Appliance Distributors Inc., Grand Junction, did the honors for the East Central district. John McKenzie, McKenzie Music & Furniture Co., led the Arkansas Valley district.

Other districts which have been functioning for as long as two months also held March meetings. The Denver metropolitan district heard "Bus" Carpenter, Appliance Distributors Inc., Denver, discuss "Sales and Customer Relations." M. C. Wilson, General Controls Co., Denver, accompanied lantern slide pictures on "Controls" with a discussion at a gathering of North East district members.

The East Central district met in February to hear W. N. McMillen, Gas Equipment Co., Denver, on "Regulators." A. B. Morrow and William H. Jacobs, Burlington, were hosts to the March district meeting.

Carl Bauer, district president, is hosting the April 5 meeting of the Tri-County group.

Organization has also been completed by the Southern Colorado district. Officers elected were R. Y. Mills, Ranchogas Inc., president; L. J. Woltman, Jordan-Woltman Co. Inc., secretary. H. H. Torbit, Union Gas & Equipment Co., was host at the March meeting.

The annual fall meeting for the Colorado association is set for Sept. 26-28 in Denver.

SEE THIS NEW LOWER PRICED FRYER

by GARLAND

**Save on the purchase price!
Save on operating costs too!**

Fourteen improvements give more heat and better distribution of heat in fryer bowl tubes, quicker heat recovery and lower cold zone temperatures. This means customers can prepare better quality fried foods faster—fill more orders and make important savings in fat. All Garland equipment is available for use with natural, manufactured or L-P gases. Get details now.



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More For Your Money—In Counter Griddles Too!



Garland Counter Griddle
No. 224-2

See our newly styled line—with and without open burners. Choice of four models, each in black japan finish or stainless steel. With or without automatic lighting. Quality-built, and priced the Garland way for outstanding value.

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FOR ALL
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Heavy Duty Ranges • Restaurant Ranges • Broilers • Deep Fat Fryers • Toasters
Roasting Ovens • Griddles • Counter Griddles

PRODUCTS OF DETROIT-MICHIGAN STOVE CO., DETROIT 31, MICHIGAN

*REG. U. S. PAT. OFF.

Texas Association Will Hold Annual Convention June 27-30

Dates for the annual convention and trade show of the Texas Butane Dealers Assn. have been changed from June 13-16 to June 27-30, according to William J. Lawson, executive secretary of the association.

The meeting has also been moved from San Antonio to Austin. The Stephen F. Austin and the Driskill hotels will be used jointly as headquarters.

New plans have been made for several reasons, the most important of which is to eliminate conflict with the International Trade show and annual convention of the LPGA in Sacramento, Calif., June 1-6.

A trade show will again be part of the Texas convention. Between 40 and 50 exhibitors are expected.

Theme of the 1948 TBDA meeting will be the promotion of a larger consumer tank program looking to the eventual solution of the fuel shortage which has recurred annually during the winter months in Texas.

Kansas

The 1948 Kansas LP-Gas Assn. convention and trade exhibit is scheduled to be held at the Broadview hotel in Wichita on April 21 and 22. This is in accord with the resolution adopted by members of the association at their meeting in October, 1947. Heretofore, the annual conventions have been held in the Fall of the year, but beginning this year, conventions will be held in the Spring.



WM. J. LAWSON

The program this year will feature selling and sales promotion as applied to the LP-Gas industry.

A trade exhibit will be held in connection with the meeting, giving manufacturers and distributors an opportunity to display the latest in merchandise.

Michigan

Members of the Michigan LP-Gas Association will meet June 28 at the Ramona Park hotel, Harbor Springs, Mich., according to a recent announcement from Lou Marshall, secretary of the organization.

Many interesting talks will be presented and discussions on the proposed changes in the by-laws pertaining to active and associate memberships will be held.

Room and hotel facilities have been reserved for the weekend preceding the meeting in order for the members and their families to take advantage of the many recreational activities offered by the resort hotel. Requests for reservations should be made to the hotel.

Florida

Selling and merchandising will be the theme of the fourth annual meeting of the Florida LP-Gas Assn. at the Sheraton Plaza hotel, Daytona Beach, April 12-13, according to President J. E. Price.

The meeting will open with a manufacturers' friendship room on Sunday afternoon. A banquet and a dance are scheduled for the second day, as well as business meetings which will carry over until April 13.

The meeting will be without the services of Harry Price, secretary-treasurer who had been with Green's Fuel, due to his death recently.

Program arrangements are in charge of W. S. Gitteau.



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We can help you put on a show that will bring you the customers. Get our tested plan for merchandising for profit.

Complete sales aids; many free,

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APRIL — 1948

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NEW PRODUCTS

Domestic Gas Range

Standard Gas Equipment Corp., Baltimore, Md.

Model: Oriole, Vulcan and Acorn.

Description: The new line of ranges, consisting of five basic models, emphasizes the development of advanced exterior styling with no radical interior construction changes.

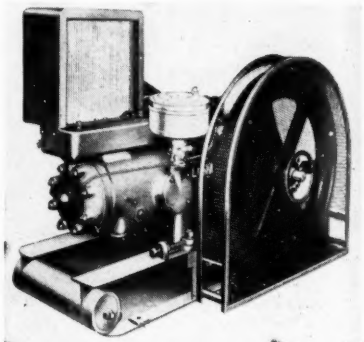
Among new features is the Magic-Mirror oven door, which becomes a transparent glass, oven-viewing window when oven light is turned on. Other points brought out include the one-piece acid resistant porcelain en-



Movie star Diana Lynn gives her stocking seams a quick check in the "magic-mirror door" of her new SGE gas range.

amel top; twin light porcelain lamp, clock and condiment set; exclusive, specially designed door handles and chrome gas valve control knobs.

Sizes of the new line are 36- and 40-in. units with cooking tops consisting of four and six burners and divided and center cluster arrangements.



Multi-Fuel Engine

White-Roth Machine Corp., Lorain, Ohio.

Model: Lorain Types "L" and "O."

Application: Employed in the petroleum industry as a long life prime mover for oil well units, pipe line pumps, generators, etc. Also adaptable for marine, mining, railway, paper, textile, chemical, quarry, public utility, and general construction applications.

Description: It is a heavy duty line

of single cylinder, horizontal, two-cycle, multi-fuel engines, now in quantity production and available for short-time deliveries, and operating on butane, natural gas, and diesel fuel. The Lorain type "O" is manufactured as a companion power plant to the type "L" and is rated at 34.3 hp., at 450 rpm. The "L" model has a rating of 10.7 hp. at 300 rpm. and 21.4 hp. at 600 rpm. It has a 7½ in. bore and 8 in. stroke, with Timken bearings on crankshaft and crosshairs. "Wet" cylinder liners can be replaced in the field.

Condenser type cooling system eliminates need for water pump and make-up water is negligible. Standard equipment includes twin disc clutch, Pierce governor, "Air Maze" oil bath type cleaner, and McCord lubricator.

Radiator, fan V-belts, spark plug and magneto are enclosed in metal guards. Over-all dimensions are: height, 52½ in.; length, 70 in.; width, 47¼ in. Shipping weight is 2500 lb.



Cylinder Cap

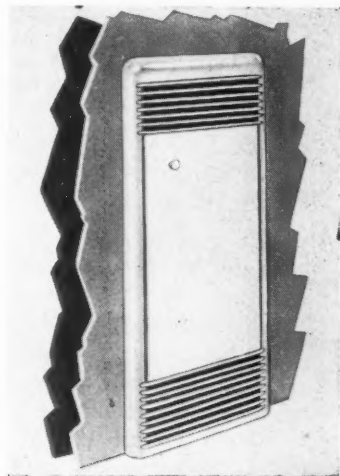
Ellis Manufacturing Co., 2411 Connor Ave., Los Angeles 22, Calif.

Application: For LP-Gas cylinders using screw type cap. May be used on cylinders for compressed gases, oxygen and charged water.

Description: This new, light weight cap is made of special aluminum alloy. It is processed to eliminate all rust and corrosion. The cap is of rigid design and insures complete protection of cylinder valves.

It is laboratory tested and approved to meet all code requirements. Furnished in natural aluminum color unless otherwise specified.

Shipping weight of cap is 15 oz. It is furnished in 3½-11 and 3⅝-11 thread. Other thread sizes available if desired.



Automatic Wall Heater

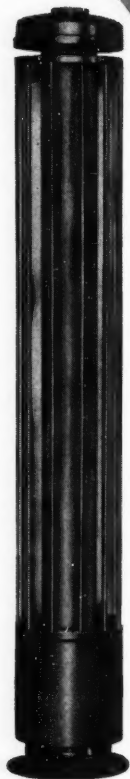
Utility Appliance Corp., 4851 S. Alameda St., Los Angeles.

Model: Wall-O-Matic.

Application: Domestic heater designed for single or multiple story construction.

Description: The wall heater has 50,000 Btu input at full capacity, with manual control for three positive heat positions or optional thermostat control. Installation in new buildings is simplified by placing plaster guides and header assembly into un-

NOW! AMERICA'S AMAZING NEW HEATER...



PANELRAY "F"

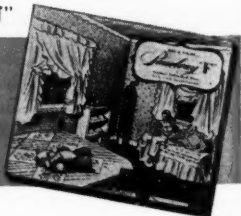
RECORD breaking success of Day & Night's wall model Panelray makes possible infra-red heating in new low-cost competitive heater.

A great new addition to Day & Night's line of space and water heaters has been realized with the introduction of Panelray "F." Low in cost, high in efficiency—fast in operation—the Panelray "F" is an infra-red ray, body height heater in 9,200 and 16,500 B.T.U. sizes, and stands in a 9" circle of floor space—may be used vented or unvented. Here is a "sure seller" and profit maker in good times or bad.

"TO SELL SUCCESSFULLY — SELL DAY & NIGHT"

FULL COLOR BROCHURES

Write for free booklet containing full color pictures of Panelray "F" installations.



DAY & NIGHT

MONROVIA, CALIFORNIA

MANUFACTURING COMPANY

ONE OF THE DRESSER INDUSTRIES

finished wall; after the room is finished the heater body is slipped into the wall opening. Two retaining channels secure the unit firmly to the finished wall. Neither living space nor carpet space is necessary for the installation.

The Wall-O-Matic has modernly styled front and rear panels with matching grills. All heat exchanger elements are out of sight. Flow control and manual control are at shoulder height. With dual models, heat can be directed in either or both directions.

Burners are available for LP-Gas, natural and manufactured gases.

Tail Gate Truck Loader

The Day Co., 306 W. 69th St., Chicago.

Application: Built to speed up loading and unloading, to minimize freight breakage, and in many instances, to eliminate a man from the truck crew.

Description: The hydraulic tail gate loader for trucks operates over the full distance from ground to truck floor level, raising and lowering loads up to 1200 lbs. The platform remains level throughout its entire travel arc, and swings up to serve as a tail gate when the truck is on the road.



The pump is available either as a power take-off model or as a hand operated unit. The loader, which fits most 1½ ton trucks, is furnished in a complete package and takes only a few minutes to install.



Pipe Joint Compound

Lake Chemical Co., 607 N. Western Ave., Chicago.

Model: Jumbo Pipetite-Stik.

Application: For large threaded pipe.

Description: Prepared in stick form, it is applied by rubbing several strokes of the stick across the pipe threads. It spreads and fills threads when turned.

The compound withstands Freon, butane, propane, gasoline, oil, sulphur, ammonia, brine, acid, gas, air, water, steam, etc. Joints are disconnected easily months after application. It lubricates and completely seals pipe joint threads, nuts, bolts, gaskets, turnbuckles, etc.

According to the manufacturer, "Pipetite" cannot flow into and clog even the smallest pipes. It withstands vibration, temperature changes, deflection, and pressure. Joints can be

remade without having to clean threads. It prevents rusting, is non-toxic, contains no lead, nor injurious ingredients, and is ideal for food and refrigeration piping.

Barrel Lifter

Thomas Truck & Caster Co., Keokuk, Iowa.

Model: BT-9 Barrel Up-Ender.

Application: To raise a heavy barrel from its side to its bottom.

Description: The BT-9 is attached to the Thomas No. 90 "One Man Barrel Truck." Steel prongs are slid under barrel or drum and with a slight downward pull on the truck handles, the barrel is upended. Will lift barrel up to 500 lbs.

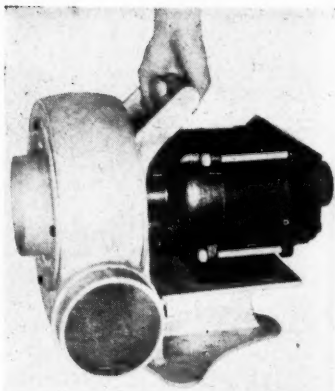


Ventilator

United Electric Motor Co., 178 Centre St., New York City.

Model: "Saf-T-Air."

Application: Designed to save lives and improve worker efficiency by providing fresh air to men working in confined places. It is said to be suitable for eliminating hazardous gases, fumes, vapors, dust and foul air from drums, vats, tanks, tank cars, boilers,



etc. Also, it is stated that it is highly efficient on welding, spray-painting, tank-coating and cargo-unloading jobs.

Description: The new portable aluminum safety ventilator is electrically motor driven and may be connected with the nearest lighting or power supply outlet without danger of overloading. The ventilator has a capacity of 425 cu. ft. per minute, weighs only 50 lb. and can be carried by one man by a balanced handle which is placed over the center of gravity so the unit cannot tip over when carried or hung. It may be used as a blower or exhauster.

Fittings Catalog

The S. H. Leggett Co., Marshall, Mich., announces the publication of its latest net price schedule on brass fittings and valves.

This schedule is applicable to the company's regular brass fittings catalog G-47-1.

Copies may be had by writing to the company at 325 High St., Marshall.

Kansas Service School's Success Points Way to Advancement



R. H. MAHNKE



JOHN KNOX SMITH

THE first LP-Gas Service School, sponsored by the Kansas LP-Gas Association, and held at the Broadview hotel in Wichita, Kansas, on Feb. 23-26, was attended by over 225 service men and dealers from five states.

The three and one-half day course was conducted in coopera-

tion with the Extension Division of the Kansas University and covered every phase of the industry pertinent to competent service on LP-Gas equipment and appliances.

Coming to Wichita for the school were service employees from Kansas, Colorado, Nebraska, Missouri and Oklahoma, with the majority being from Kansas.

The various subject matters were discussed by leaders from the industry who presented their subjects in the language service men could easily comprehend, and wherever practical, actual demonstrations were used to illustrate their points. Charts and slides were also utilized to make the subject matter easier to understand for practical purposes.



A group of service men who attended the Kansas service school in February are gathered at recess time for informal discussion.



This picture shows (left to right) A. J. Dawson, manager, Extension Division, Kansas University; F. N. Havens, Union LP-Gas Systems, Independence; W. L. Melcher, A. O. Smith Corp., New Orleans, who were instructors at the Kansas service school, and (far right) J. L. Newkirk, who attended the school from Caldwell, Kansas.

Of particular significance is the fact that many questions were put to the instructors at the close of the discussion, indicating the interest in complete knowledge by those in attendance. Satisfactory answers to the group by the instructors clarified many queries that existed in the minds of the students.

Appearing on the program as instructors were the following industry representatives:

C. M. Stroup, Skelgas Division, Skelly Oil Co., Kansas City, "The Product, LP-Gas."

D. D. Buttolph, Phillips Petroleum Co., Bartlesville, Okla., "LP-Gas Containers."

O. C. Hibarger, Mid-Continent Butane Equipment Co., Wichita, "Handling and Installing Underground Tanks."

George Bolander, Union LP-Gas Systems, Parsons, Kans., "Handling and Installing Aboveground Tanks."

Ralph Engstrom, The Bastian-Blessing Co., Chicago, gave a complete illustration of "Tank Fittings and Regulations."

Wayne Ward and R. O. McBride, Union LP-Gas Systems, staged a de-

monstration on the "Installation of Piping." The actual cutting of the pipe was done before the group and all fittings necessary were placed on the piping installation to a range which eventually was connected from a tank on the stage in front of the students.

George Francke, Imperial Brass Co., Chicago, demonstrated the use of tubing and explained each operation.

Dewey Thoes, Cities Service Oil Co., Wichita, "Transfer of Products." This paper will be published in the May issue of BUTANE-PROPANE News.

F. F. Constance, service manager of the Tappan Stove Co., Mansfield, Ohio, demonstrated construction and servicing of a "CP" LP-Gas range.

W. L. Melcher, A. O. Smith Corp., Houston, Texas, discussed and demonstrated the proper and safe servicing of LP-Gas water heaters.

J. D. Eckles, The Coleman Co., Wichita, "Floor Furnaces and Heating."

E. L. Burnett, Chas. D. Jones Co., Kansas City, "Automotive Heating Controls."

T. H. Rive, Servel, Inc., Evansville, Ind., presented a practical discussion on "LP-Gas Refrigeration," demonstrating the various points.

Ralph Abbott, Ensign Carburetor Co., Huntington Park, Calif., "LP-Gas Carburetion."

Rex Wheeler, The Humbert Co., La Crosse, Kans., "Proper Venting of Appliances."

Clyde Latchem, state fire marshal for Kansas, "Rules and Regulations."

P. Kay Scruggs, manager Kaw Valley Skelgas Service, Topeka, Kans., "Customer Relations."

Of interest to all LP-Gas dealers should be the fact that the large attendance, plus the keen interest displayed at the school, is an indi-

cation of the need for service schools. In the final session, a vote was taken to determine the reaction of the group as concerns schools in the future. By a unanimous vote, those in attendance expressed the desire to have more such schools.

The committee arranging the Kansas LP-Gas Service School consisted of John Knox Smith, field engineer, LPGA, Chicago; Henry Wieckman, Skelgas Division, Skelly Oil Company, Kansas City; R. H. Miller, president, Mid-Continent Butane Equipment Co., Wichita; R. H. Mahnke, executive vice president, Kansas LP-Gas Association; and A. J. Dawson, University of Kansas Extension Division.

Extra Copies June Safety Issue Must Be Ordered by May 1

The June issue of BUTANE-PROPANE News will be devoted almost exclusively to discussions of safe practices in handling liquefied petroleum gases. Many operators, realizing the importance of distributing such information to everybody concerned with the industry, and to many others, as well, have placed orders for extra copies. Advance special orders already total more than 5000 copies and additional orders are coming in daily.

Because of the critical paper shortage, we will supply extra copies of the June issue only to those whose orders have been received by May 1. Subscribers will receive the magazine as the regular June issue.

Prices for extra copies are as follows: Up to 500, \$1 each; 500 to 1000, 75 cents each; 1000 or more, 50 cents each.

Address orders for extra copies to BUTANE-PROPANE News, 1709 West Eighth St., Los Angeles 14, Calif.

Louisiana Dealers Seek Larger Consumer Storage

A meeting of the bonded LP-Gas dealers of Louisiana, held Feb. 21, was called for the primary purpose of outlining a program for increasing consumer storage for LP-Gas, according to L. C. Parker, executive secretary. The meeting was attended by 40 operators who displayed keen interest in the subject matter, and who participated in a spirited discussion of the subject. Credit information and advertising procedure were other topics discussed.

John M. Robinson, Woodworth, La., president of the National Butane-Pro-



L. ABRAMSON

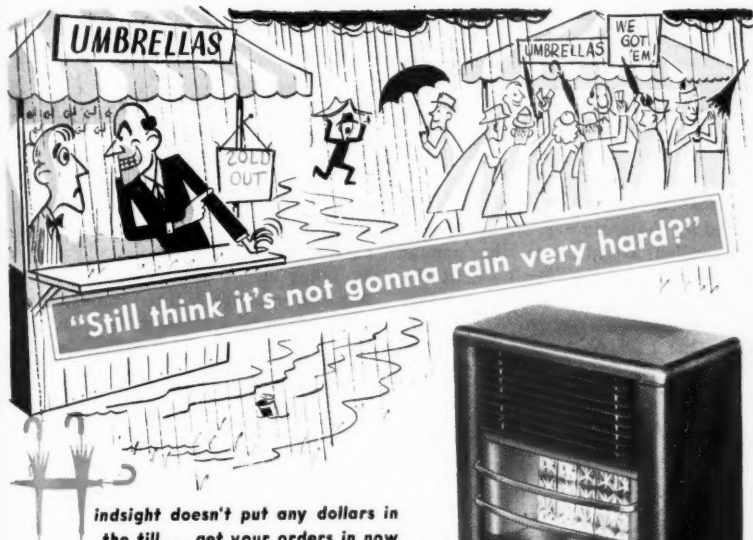
pane Association, read a telegram from Chairman Harry J. Kennedy NPC Marketing Subcommittee on petroleum industry steel requirements, stating that Mr. Robinson had been named member of a LP-Gas group to work with K. W. Rugh, who was nominated to represent the LP-Gas marketing industry on a subcommittee appointed as a part of the National Petroleum Council's program to determine the petroleum industry's steel requirements.

A resolution was adopted at the meeting to the effect, "that the Louisiana Butane Dealers Association, Inc., would attempt to promote and carry out the tie-in tank plan, which some of the dealers had already initiated and which has been in use in Texas for a little more than a year, with the hope of getting the consumers to increase their storage capacity."

It was agreed that the size of tank to be used in the tie-in program would be settled locally when the regional meetings are held throughout the



This group of Louisiana LP-Gas dealers met Feb. 21 to discuss larger consumer storage at the call of L. C. Parker, executive secretary, shown in center of front row. Talks were given by John M. Robinson, president of the National Butane-Propane Association, at Mr. Parker's left, and by R. Leslie Kiper, association president, shown at extreme right of front row.



insight doesn't put any dollars in the till... get your orders in now for the Dearborn heaters you're going to need when it starts raining orders!

And we know how hard it's going to rain, because Dearborns are the chief order-makers on the merchandise front today. Dearborn holds top position in dollar volume of gas space heater sales by consistently giving consumers top dollar values. Over 1,000,000 users already know Dearborns give them top dollar value, and Dearborn will tell millions more in frequent magazine, radio and newspaper advertising throughout 1948. Dearborn safety, Dearborn styling and Dearborn performance will still be the world's champion order-maker in 1948. Back the champion!

**Place your order now...
Get the Dearborns you want**

For full information about Dearborn's complete line of superb heaters, floor furnaces and evaporative coolers, write TODAY to



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113 Courtland Street Atlanta, Georgia	1738 East Sycamore Columbus, Ohio
285 West Trigg Avenue Memphis, Tennessee	Kansas City Terminal Warehouse
Rennison Building 347 Carondelet Street New Orleans, Louisiana	Kansas City, Missouri
Luther Transfer & Storage Company Lubbock, Texas	P. O. Box 1134 Omaha, Nebraska
151 1/2 East Reno Oklahoma City, Oklahoma	2221 South Adams Street Denver, Colorado
3625 South Grand Avenue Los Angeles, California	
Merchandise Mart 1353 Market Street San Francisco, California	

Dearborn

THE WORLD'S FINEST, SAFEST GAS HEATERS

state, but that effort would be directed toward inducing the consumer to install as much additional storage as possible.

It was decided that the advertising program and credit information would be handled at the regional meetings.

The question of getting additional members in the association was discussed by the secretary, and the president called attention to the annual convention fixed for April 14, at the Jung hotel, New Orleans, and asked that each member of the association give some thought to the election of the board of directors for the new fiscal year, which begins April 1. New officers will be elected, also. The program is in the hands of a committee composed of Louis Abramson, John Davis and W. J. Leamont. There will be dinner and a dance in the evening.

Green's Fuel Wins First Honors in Florida Pageant

The largest crowd ever assembled in Sarasota lined the streets the night of Feb. 21 to witness a great display of pageantry on the west coast of Florida upon the occasion of the Pageant of Sara De Sota. The glittering display of floats, marching bands and Ringling Brothers' Barnum & Bailey circus performers stretched for approximately three miles, with 100,000 spectators lining its path. For the third year in succession Green's Fuel had the winning float.

The Green's Fuel entry was an exquisite coach-and-six with a beautiful Cinderella.

Last year's winning display was an enormous floral peacock, with beautiful girls adding life to the float.

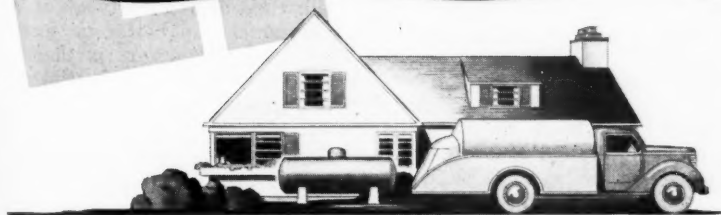


The winning float in Florida's "Pageant of Sara de Sota," won by Green's Fuel, Inc., of Sarasota.

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THE market for automatic heating is already huge and it's snowballing every day. What's more, there's room for almost unlimited development. And with each L-P Gas installation, you make a really substantial addition to your volume and your profit.

For every job you sell, make certain the controls are Honeywell. Only Honeywell makes a *complete* line—thermostats, solenoid, motorized and diaphragm valves and pilotstats—specifically designed and tested at higher pressures for L-P G.

To support your activities, Honeywell's nation-wide sales and service organization is ready to respond whenever you call. So strike hard *now* for the growing source of big profit business—automatic heating—and for controls, always rely on Honeywell—the leader.

Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Toronto 12, Ontario.

MINNEAPOLIS
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CONTROL SYSTEMS

POWER



Butane as a Motor Fuel

An Explanation of Some So-Called Mysteries

By G. L. HOLZAPFEL

SINCE the year 1930 when a Los Angeles bus was the first vehicle to run successfully on butane and very definitely proved its value for use on motor vehicles, many problems have presented themselves and have been solved in the use of LP-Gas in internal combustion engines. There is still much work to be done, even after the 18 years which have elapsed.

When butane began to be extensively used on motor vehicles, the carburetors could not be called reliable; perfection comes, as a result of experience, only after the benefits conferred by many failures.

Even when carburetors became efficient and reliable, operators began to suspect the suitability of various engines for butane. Some engines appeared to show definite advantages, while others did not perform well at all. The troubles did not, however, appear to be consistent, which mystified people still more. Thus, there began to build up a sort of mysterious atmosphere which made many operators doubtful about the fuel.

Even today there are many who think there are some types of engines which run better on butane than others. The fact is that butane is just another combustible and will operate on all engines with equal success, provided it be properly installed and applied.

Some of the difficulties are still traceable to faults of carburetor design, but most of them are due to incorrect application. Of course, the troubles experienced by the operators are not imaginary; they are very real. Let us analyze a few of them.

Consider first a few of the technical characteristics of butane. One gallon of it contains only about 100,000 units of heat, compared with 125,000 for gasoline. Thus, when you buy a gallon of butane, you get about 20% less heat than when you buy a gallon of gasoline. The fact that a car will travel about the same distance on a gallon of either fuel is just evidence of the inefficiency of gasoline.

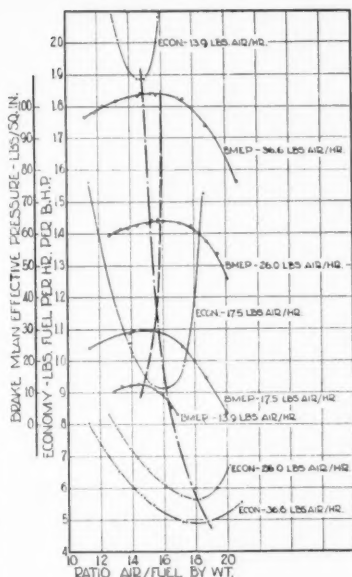
Bearing in mind that combustion takes place in a closed cylinder, it becomes evident that the exact proportions of air and fuel must be put into the cylinder before the intake valve is closed. If there is not enough air, the whole of the fuel cannot be burned and some is therefore wasted. If there is too much air, the fuel all burns, but then there is less power, because the unburned air is taking up valuable space in the cylinder.

Gasoline Distribution Uneven

Distribution of a mixture of constant strength is therefore important. With butane it is easy, but with gasoline the case is different. Gasoline goes in mostly in liquid form and is vaporized mostly by the heat in the cylinder when it arrives there. But to distribute it evenly to the various cylinders is a thing that engineers have, so far, been unable to accomplish.

As a result, if one cylinder gets the right mixture, the others are likely to get a mixture much too strong, so that some of the unburned fuel remains after combustion and is swept out into the exhaust pipe and wasted. This is mostly why a gallon of butane will go as far, or nearly as far, as a gallon of gasoline—further, if the compression is raised.

Butane has another advantage in its exceptionally high anti-knock value which permits of higher compression. Higher compression gives greater efficiency of combustion and therefore more power and mileage from a given quantity of fuel. Using compressions as high as are



The effect of mixture ratio and throttle position on the economy and power when operating with butane-air mixtures at 1000 R.P.M. and compression ratio of 6.08.

feasible with butane, it is found that a gallon of butane will develop more useful energy than a gallon of gasoline and will take a vehicle farther.

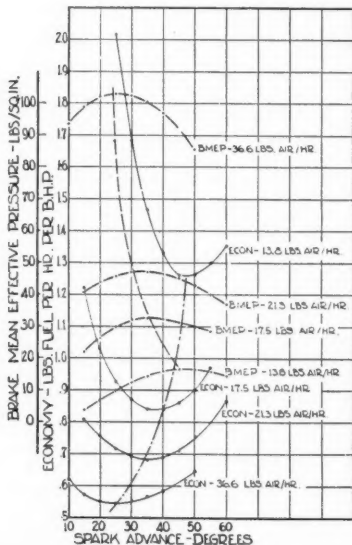
When it comes to power developed, the case is a bit more complicated. As heavier fuel, when it is vaporized, takes up less space than lighter fuel, it follows that more heat can be introduced into the cylinder by the heavier fuel. This means more power for a given volume of combustion space.

Also, the fact that gasoline goes into the cylinder in the form of a

liquid, or at any rate, very incompletely vaporized, means more room for air and more power.

Besides this, because gasoline goes into the cylinder as a liquid, it cools the incoming charge and this again means more power, for the charge of air is still further increased.

These three factors go a long way to make up for the inefficiency of gasoline, otherwise the bad distribution would result in considerably decreased power for gasoline as compared with butane, for by now it must be obvious that gasoline is very wastefully used.



The effect of spark setting and throttle position on economy and power when operating with butane-air mixtures at 1000 R.P.M. and compression ratio of 6.08

Just how near to the correct mixture do we arrive when we run an engine on butane? Obviously, with gasoline we are very far from the correct mixture on *all* cylinders. It may be right on one, or even two, but not on all, because of bad distribution in the engine manifold. With butane entering the manifold in the form of a gas, extremely good distribution is obtained. But the mixture that enters the manifold varies quite a lot from the ideal mixture, even with butane.

The fuels sold as butane vary considerably in their composition. Normal butane has a heat content of 103,000 Btu per gal. while propane has only 91,300. The heat contents per cubic foot are 3267 and 2521, respectively. This difference is partly compensated for in a carburetor by the difference in gravity of the vapor, but the fact remains that a different adjustment is really necessary when passing from one fuel to the other.

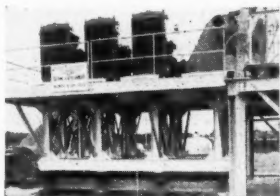
Fuel Character Will Vary

Bearing in mind that the butane bought at filling stations is always a mixture of several different gases, it is obvious that the calorific value varies a good deal and that the efficiency in an engine, if the carburetor setting be not changed, must vary accordingly.

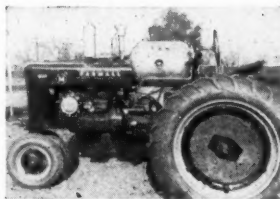
Calculations show that if a carburetor be set for operation on normal butane and then fed with propane, the mixture will be 11% weaker. That would mean 14.5 to 1 instead of the standard 13 to 1 setting for power. While the change

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Industry . . . Transportation . . . Agriculture wherever fuel economy and operating efficiency are key factors, you will find ALGAS "job-tested" conversion equipment setting the pace with maximum pay loads at minimum costs.



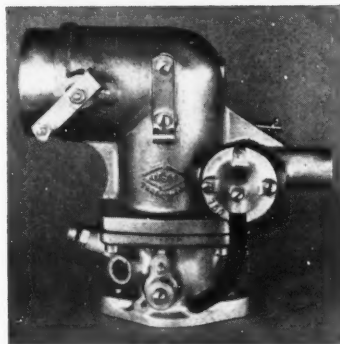
The largest engine can be equipped with an ALGAS carburetion unit.



There is an ALGAS unit for all makes and sizes of farm tractors.

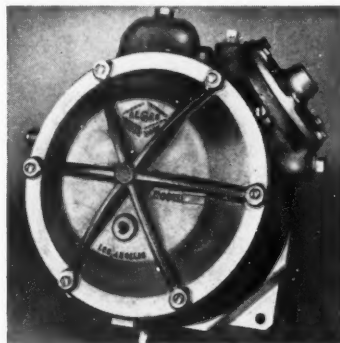
AMERICAN LIQUID GAS CORP.

1109 Santa Fe Avenue
LOS ANGELES, CALIF

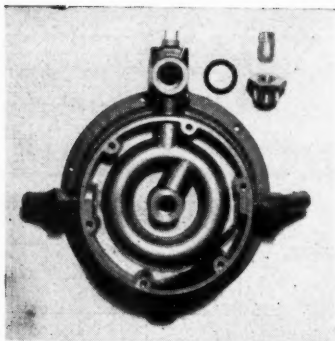


Multi-jet Mixer or Carburetor—1400 Series

ALGAS multi-jet mixer units—for LP or Natural gas—are now available for all types and sizes of internal combustion engines. Extra sensitive zero pressure gas regulators are also available for the gas industry.



Model 1500 Converter, combines primary and secondary regulation with heat exchanger.



A very simple method of controlling water temperature and thus the temperature of vaporized fuel. Note thermostat in water chamber.

from pure butane to pure propane is seldom made, there are many variations in the composition that could change the setting as much as 5%.

While the changes of mixture strength due to variation of fuel may not themselves be very serious, provided the carburetor is accurately set in the first place on a fuel that is known to be average, they do add very seriously to any errors in the mixture strength which the carburetor may give over the whole range of loads and speeds. That makes it all the more important to get a carburetor that is accurately calibrated.

This brings us to the matter of part-load mixtures. They are much more important than is generally supposed and a variation from the ideal may have serious consequences upon performance and economy, especially when the error happens to be at that speed and

load upon which a vehicle is mostly operated.

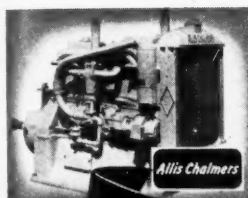
The most economical part throttle mixture varies very considerably, especially at small throttle openings, so that 5% variation may make a noticeable difference to economy. For instance, on cruising mixtures, where a ratio of 16 to 1 may be indicated, a variation of 10% in the mixture strength may make a variation of an equal amount or more in the economy.

But when spark advance is considered, if the timing should not be exactly right, the loss of economy might be much greater. In fact, slightly incorrect settings may affect the economy by substantial amounts.

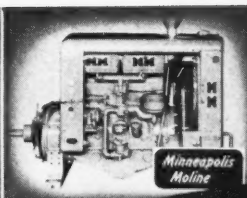
Air Temperatures Are Different

Having considered the importance of the mixture strength and its serious effect upon economy, it becomes obvious that, if there are any other factors which affect it, the variation will be still worse. Unfortunately there is another factor and it has more influence on the mixture strength than all the others put together. If we add this factor, the results can be unbelievably bad—and are. Here is the explanation for many of the “mysteries.” This other factor is the relative temperatures of air and butane. On a badly designed carburetor, the temperature of the butane vapor can vary as much as 200° F. in a day's run. On most existing carburetors it may easily vary as much as 100°.

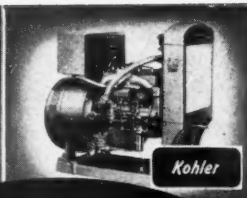
But the temperature of the air varies, too. It may vary as much as



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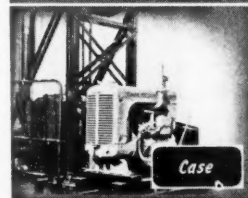
International Harvester



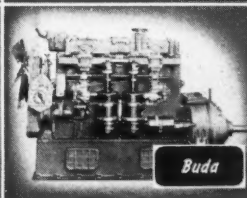
Waukesha



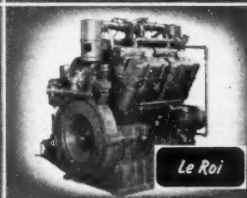
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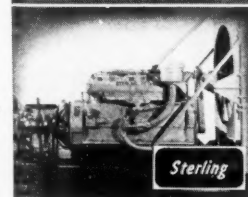
Case



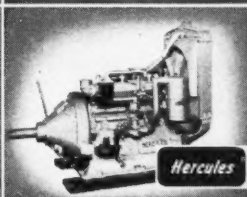
Buda



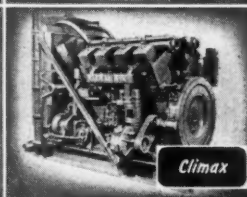
Le Roi



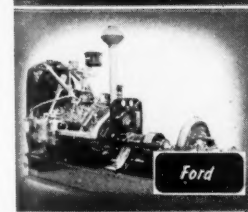
Sterling



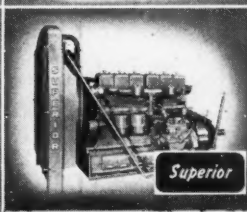
Hercules



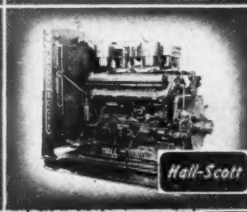
Climax



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100° in a day's run. Add together these variations and see what the potentialities are.

When a gas is heated, it expands 1/460 of its volume for each degree increase in temperature.

Thus, when you start out at the top of a mountain in the morning, where the temperature may be 20°, and drive into the valley where the temperature may be 100°, the absolute temperature will change from 480° to 560°, which is an increase of over 16%. If the setting was made at normal temperatures, the variation has been about 8% both ways.

Assuming that the temperature of the butane varies as much as 100°, which is common (say from 60° to 160°), the figures would be 520° to 620°, which is a variation of 19%.

Air Heavier, Butane Lighter

Now assume that, on a very cold day, we go up a steep hill; it is possible for the air to be at zero and the butane at 200°. In this case, the air would be at 460° and the butane at 660°. The air is now about 11.5% heavier than normal and the butane 27% lighter.

Luckily a rarified gas flows faster than one at normal temperature, but allowing for that, the variation of flow amounts to 12.5% which, added to the 11.5% for the air, makes a total of 24%. This is enough to cause all the troubles ever complained of. It explains why many operators who send their equipment up mountains, swear by all that is holy that the mixture gets weaker and the power falls off

more than would be expected by the increase of altitude.

This weakening of the mixture has given rise to the myth that butane carburetors have to be adjusted for high altitudes. But a moment's consideration shows that this is not the case, for the supply of butane, being controlled by an atmospheric regulator, gas and air are always inevitably at the same pressure, and therefore, but for the variations mentioned, would always be metered in exact proportions.

Thermostat Controls Temperature

Just how are we to correct this trouble of varying temperatures? It is not very difficult to keep the temperature of the butane constant; butane carburetors with thermostatically controlled water temperature are already obtainable. With the temperature of the water constant, the butane can be kept the same and half of our problem is solved.

The temperature of the air could be controlled, also, but very large volumes of gas would have to be dealt with. There is no reason, however, why butane should not be kept at the same temperature as the in-going air.

Controlling the temperature of the butane only has shown remarkable improvement in operation; if butane and air were always at the same temperature, very important improvements would result.

The mystery of why butane seems to work better on some types of engines than on others is another point requiring some elucidation.

One report that came in recently was that an operator had used butane on International trucks with astonishingly good results, so that he decided to fit up his Fords, also. But when he extended the use of the fuel to these vehicles, the results were very disappointing. Investigation showed that, when fitting the truck with butane, he had removed the existing gasoline carburetor, which had a double throat, and replaced it with a butane mixer with a single throat. The trouble was cured when the original gasoline carburetor was put back and a butane mixer fitted to the airhorn.

Starting is another problem that has raised many questions, for it is undeniable that, on the average

installation, butane does not give so good a start as gasoline. (Latest designs show great improvement in this respect.)

The reason for this is that a gas is harder to handle than a fuel that remains liquid. A butane regulator is made to supply fuel at exactly atmospheric pressure—so far as is possible. But as it has to be shut off when the engine stops, it stands to reason that the pressure in the regulator, when it begins to feed, is slightly below atmospheric. It is this slight variation that causes designers so much trouble.

Although there is, when starting, quite a strong suction in the intake manifold, that does not help in drawing butane from the regulator, for at that very low engine speed

CENTURY

BETTER 3 WAYS

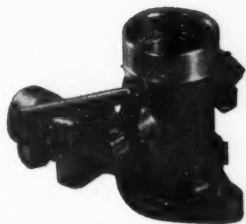
- 1—EASY STARTING—equal to gasoline. At 10 degrees below zero, a Denver dealer reports good starting.
- 2—FUEL ECONOMY—first LP-Gas carburetion to compare favorably with gasoline mileage. (If actual mileage figures already available continue, the comparison will be much better than anticipated.)
- 3—POWER—as good, or better in most cases, than gasoline.

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3C CONTROLLED COMBUSTION CARBURETION



3C is the only carburetor which **POSITIVELY** controls fuel mixtures at all throttle openings.

(particularly in very cold weather), the air will feed back through the main jet into the intake manifold more easily than the butane will come out of the regulator.

Thus, when starting from a slowly turning engine, as in very cold weather—and also when the battery is not up to par—the mixture is too weak. The operator, aware of this, primes the regulator and makes the mixture too strong and starting degenerates into a regular hit-and-miss business.

To avoid this, various automatic primers have been designed, but it still seems that the ideal starting has not yet been obtained. Of course, the more sensitive the secondary regulator, the better the chances of getting a quick start. (One company is designing air unit that may go a long way toward achieving the ideal.)

Instant Starting on Butane

A well designed butane carburetor should, however, give much better starting than a gasoline carburetor, because of the better distribution. Although mixtures of butane and air are not so easily ignited as those of gasoline and air, given the right mixture, an engine will start instantly on butane in any weather. Once the engine is started, it will produce power instantly and will not have to be warmed up, as is the case with gasoline. (It is assumed that the madman who races his engine immediately it starts is eliminated from this discussion.)

One other difficulty in starting

on butane is that, after standing for a while, the butane in the low pressure regulator becomes diluted with air, due to the fact that gases tend to diffuse into each other. It is for this reason that priming the regulator is necessary when starting from cold.

As far as fuel consumption is concerned, there have been many mysteries, some of which are explainable by the lack of control of temperature previously explained. It must be borne in mind that economy requires a very careful control of mixture.

Figuring Best Mixture

The most economical mixture for operation is not necessarily the mixture for complete combustion, viz., 14.5 to 1. For maximum economy, lean mixtures are necessary, but they can be used only for part-throttle operation. If used on full throttle, burned out valves would result, for lean mixtures burn more slowly than the correct mixtures for complete combustion, so that, when the exhaust valve opens, the temperature of the gases is too high for their good health.

Therefore, it is essential for economical operation to use an economizer which cuts down the mixture strength for part-throttle operation, yet allows the full strength mixture when the intake manifold depression falls below a certain predetermined figure.

Economy, however, depends not upon the same strength of weak mixture for all conditions. Actually, the greater the intake manifold vacuum, the stronger the mixture

that must be used for maximum economy. For idling, the most economical mixture is actually the same as the full strength mixture, viz., 12.5 to 1.

To get maximum economy, these mixtures must be carefully controlled. It is safe to say that no butane carburetor follows the range very accurately; when mixture strength variations are brought about by lack of control of the temperature of the incoming butane, instead of having an economical mixture for certain loads on part-throttle, we may have a very uneconomical mixture. This explains so many cases of bad economy on an apparently good setup.

Spark Control Can Improve

Spark control for butane is another thing that has not yet been properly worked out. The spark advance for maximum economy varies considerably both for load and speed. It is unlikely that the correct advance is often obtained for all conditions. If it varies much, the loss of economy may be surprisingly great.

Curves showing the loss of economy due to variations of the spark setting from the ideal were made by Prof. C. J. Vogt of the University of California at Berkeley. He also worked out the details showing the correct mixture strength for maximum economy. The figures are given in the paper he read before the American Petroleum Institute on Nov. 14, 1935.

It is a long time since this knowledge was made public, but so far,

full advantage has not been taken of it. Perhaps now we shall get nearer to the perfect butane carburetor. Whereas, not much more can be done at the moment with gasoline carburetors due to the troubles of distribution, the butane carburetor carries no basic limitations that would prevent its being very near to perfection.

Butane Will Get Even Better

Therefore we may expect the many great advantages which butane shows over gasoline to be increased in the future. Competition has a stimulating effect upon design which makes it impossible for a firm to rest very long upon its laurels; continual improvements are necessary to maintain one's place.

In conclusion, just to buy an outfit and hook it on to a vehicle, much as one would hook up a heater or a new horn, is not to be recommended, although it is much too frequent a practice for the good of the butane carburetor industry.

To the user, we would recommend that he make enquiries and find the agent in his district that has the most satisfied customers and then give him the job to do. The mechanic who makes an installation may ruin the chances of success with the best carburetor made, while the man who understands the job thoroughly can make almost any carburetor work satisfactorily. The lucky combination of the best carburetor and the best mechanic to install it is an insurance of absolute satisfaction.

THE TRADE

Superior Valve & Fittings Co. announces that at a special meeting of the board of directors on Feb. 25, Willis A. Siegfried was elected to the office of president, to succeed the late John S. Forbes.

Mr. Siegfried joined the company as assistant to the sales manager in 1944 and in 1945 was made sales manager. In April of 1946 he succeeded to the office of vice president in charge of sales and became vice president and general manager in October of 1947.

Mr. Forbes' death occurred on Feb. 16 at his home in Pittsburgh. He had suffered from a heart ailment in recent years, although he was active



W. A. SIEGFRIED

in his business to the time of death. He did not live to celebrate the tenth anniversary of his founding of Superior Valve and Fittings Co. on April 18, 1948.

Mr. Forbes was a member of many industry associations and was particularly active on the Compressed Gas Manufacturers Assn. valve thread standardization committee.

Harry G. Smith has been elected vice president and general manager of **Smith Meter Co.**, Los Angeles, a company announcement states.

Starting 10 years ago in their engineering research division, Mr. Smith has successively held the positions of Western sales manager and general sales manager.

The appointment of John E. Heuser as assistant sales manager of the **Le Roi Co.** has been announced by John



▲
This is the newly acquired plant of 200,000 square feet where gas ranges in greatly increased quantities will be built by the **Anderson Stove Co.**, Anderson, Ind.
▼

Edward G. Robinson and Burt Lancaster appear in this factory scene from the Universal - International picture "All My Sons," filmed in the plant of the Western Stove Co., Inc., Culver City, Calif.



M. Dolan, vice president in charge of sales for the Milwaukee company.

Mr. Heuser is a graduate engineer from the University of Wisconsin with over nine years of sales experience. During the past three years he has handled much of the sales administration for both Le Roi engine and compressor products.

Mr. Heuser will take over many of the duties of Cecil W. Brown, who recently resigned as general sales manager of the Le Roi Co.

Consolidation of the industrial engineering and the product engineering departments under David A. Edwards as engineering manager and Paul F. Metz, chief engineer, has been announced by Arthur M. Krieger, works manager of the Estate Heatrola Division, Noma Electric Corp., Hamilton, Ohio.

Mr. Edwards joined Estate Heatrola Division in April, 1946, as chief industrial engineer. Previously he had

been associated with Carnegie-Illinois Steel Corp. for eight years as supervisor in cost and production planning.

Mr. Metz has been in the Estate engineering department for 25 years, the last five years as chief engineer.

Helen E. Bending, editor and writer, who previously spent a year with The Bastian-Blessing Co., Chicago, has returned to gather material and write copy for the Rego LP-Gas catalogs, announces Ellsworth L. Mills, vice president of the company.

A graduate of Roosevelt College, Miss Bending had several years experience as a newspaper writer and editor before joining the Gary Works of the Carnegie-Illinois Steel Corp. as editor of that company's cost-planning program. Then a year at Bastian-Blessing was followed by three years with Montgomery Ward, where she became the first girl ever to write copy for that firm on hand tools, lighting equipment, plumbing and

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Rectorseal #2 never dries out . . . never hardens . . . never loses its perfect sealing action. This amazing thread and gasket seal withstands pressures to 6500 lbs. p.s.i. and temperatures from minus 50 deg. to 350 deg. F. It is insoluble in Butane or Propane gas or liquid.

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NUMBER TWO



HELEN BENDING

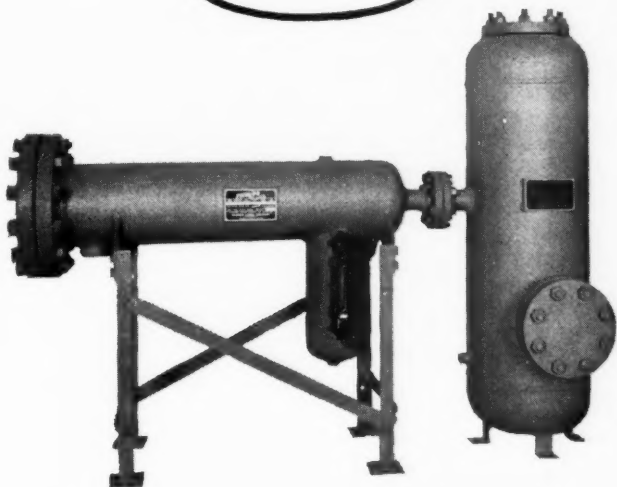
heating. An editorial job with "American Family Magazine" and copywriting for Alden's, Inc., were also included in the 15 years of valuable experience she brings to her new work on Rego catalogs.

It is also announced that A. B. (Bud) Dally has joined the Rego division of the company to serve as sales engineer in the Chicago office.

After studying engineering at both the University of Pittsburgh and Carnegie Tech, Mr. Dally spent six years in the engineering department of Gulf Oil Corp. in Pittsburgh. For the past five years, he has been employed in the sales divisions of several manufacturers of high pressure gas controls and LP-Gas equipment.

Announcement of the opening of a New York office to handle Atlantic district sales of Peerless Pumps is made by F. E. Fairman, Jr., vice president of the Food Machinery Corp. and general manager of its Peerless Division. Sales in this district were previously handled at Ardmore, Pa.

EXCEL-SO



A NEW 2-STAGE DEHYDRATOR **A WARNER LEWIS PRODUCT**

**A NEW Technique for
complete Dehydration of:**

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GASOLINE

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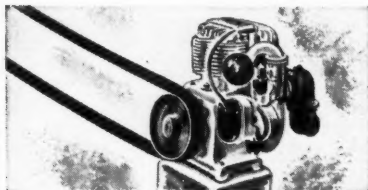
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The New York office is located at 37 Wall St., New York.

According to B. A. Tucker, Peerless Pump Division sales manager, R. S. Engemoen has been appointed district manager in New York.

The Cities Service Oil Co., Bartlesville, Okla., has announced the election of A. W. Ambrose, currently president of the company, to the board of directors to succeed the late Burton C. Tremaine of Cleveland, Ohio.



A. W. AMBROSE

Mr. Ambrose joined Cities Service in 1923 and became president of Cities Service Oil Co. (Delaware) in 1946.

Charles Lukens Huston, Jr., has been elected as vice president and Robert G. Bloom as controller of Lukens Steel Co., Coatesville, Pa., Robert W. Wolcott, Lukens president, announces. Mr. Huston had been executive assistant to the president, a position he will continue to hold.



C. L. HUSTON, JR.

Mr. Huston has been associated with Lukens and its divisions since 1939. In 1943, he was named president of Lukenweld, a division of Lukens, specializing in the designing, engineering and fabricating of steel plate structures by welding. In 1944,

HERE ARE YOUR ANSWERS

PARTIAL LIST OF CONTENTS

WHAT IS PROPANE?—Supply. Properties. Definitions.

THE BEHAVIOR OF GASES—Pressure. Specific Gravity. Density. Compression.

HEAT AND TEMPERATURE—Heat Transfer. Conduction. Convection. Radiation. Expansion.

WHAT GOES ON IN A PROPANE CYLINDER? Construction. Filling.

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TESTING FOR LEAKS AND ADJUSTING BURNERS—Flame Characteristics. Servicing.

FUNDAMENTALS OF THERMOSTATS—Types. Service. Expansion of matter under heat.

PILOTS AND PILOT CONTROLS — Types. Causes of Failure. Proper Location. Adjustment. Safety Pilots.

BURNER DESIGN AND APPLICATION — Ports. Orifices. Burner Installation.

APPLIANCE CONVERSIONS—Inputs for Domestic, Commercial and Industrial Burners. Required Information.

FACTS ABOUT WATER AND WATER HEATERS—The Effects of Water on Heaters. Usage Tables.

TYPES OF WATER HEATERS—Installation. Safety Devices. Efficiency.

SELECTING AND INSTALLING WATER HEATERS—Demand Analysis. High Bill Complaints. Service Problems. Peak Demands. Capacities.

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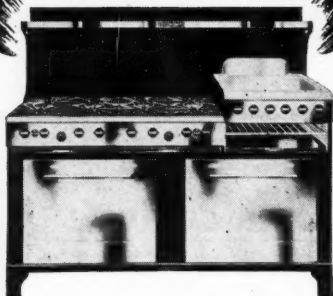
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ECONOMY
De Luxe CAFE RANGES

he assumed the general managership of the division as well as continuing as president. In 1946, he was named executive assistant to the president.

Mr. Huston is a son of Charles Lukens Huston, first vice president of Lukens Steel Co.

Robert G. Bloom has served as controller of Lukens since 1943. Starting with the company in 1927, he was, successively, chief clerk, assistant controller and auditor.

Dr. Charles W. Rippie has joined Lukens Steel Co. as a member of its sales development staff, J. Frederic Wiese, vice president in charge of sales, announces. Dr. Rippie will specialize in sales development work on Lukens steels, with particular emphasis on their applications in the petroleum industry.

Ansul Chemical Co., Marinette, Wis., recently announced the appointment of Kenneth B. Covert to the position of sales manager of its fire extinguisher division. He took over his new post shortly after the first of the year.



K. B. COVERT

Mr. Covert joined the **Ansul** organization in 1945 and has been in charge of refrigerant sales at the company's eastern office in Philadelphia.

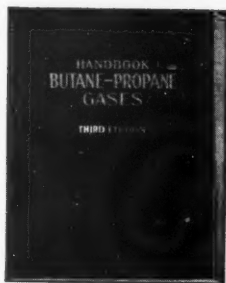
John Richard Hall, gas engineer, is now located at the Newark, Calif., plant of **James Graham Manufacturing Co.** (Wedgewood gas ranges) in charge of the engineering laboratory.

"Dick" Hall was formerly connected with **Cribben & Sexton Co., Chicago**.

HANDBOOK BUTANE-PROPANE GASES

REVISED JUNE, 1947

- **Up-to-date technical facts on LP-Gases.**
- **352 Pages. Illustrated with Charts, Diagrams and Photographs.**



Check this partial list of contents.

INTRODUCTION

The Progress of the Industry and the History of its Development.
The ABC of LP-Gas, an Introduction to LP-Gas Operations.

PHYSICAL AND CHEMICAL PROPERTIES

Properties of the Hydrocarbons in LP-Gas.
Properties of Butane-Propane Mixtures
Volume Correction Factors
Analytical Determination and Testing

PRODUCTION OF LP-GAS

Natural Gasoline Plants, Recycling Plants, Oil Refineries

TRANSPORTATION AND STORAGE

Delivery by Truck, Rail, Water, and Pipe Lines
Storage Tank & Pressure Vessel Design
Liquid Metering and Pumping Systems

UTILIZATION OF LP-GAS

Comparative Performance with other Fuels
Appliance Installation and Testing
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Installing and Servicing LP-Gas Systems
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N.B.F.U. Pamphlet No. 58 (1947).
Motor Carrier Regulations
Freight Regulations
Unloading Tank Cars
Marine Regulations

APPENDIX

Products Liability Insurance
Handy Tables for Field Use
The Interchangeability of Other Fuel Gases with Natural Gases
Flame Weeding
Bibliography
Glossary of Terms

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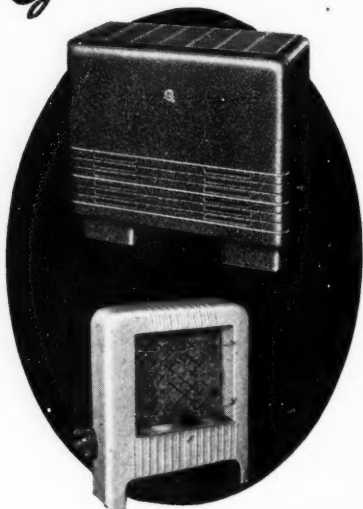
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Write today for new descriptive literature.

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MANUFACTURING CORPORATION
INCORPORATED
LOUISVILLE, KENTUCKY

L. M. Keating, assistant to the president in charge of distribution of the A. O. Smith Corp., has been appointed executive administrator of the company's Southwest district office in Houston, Texas, it is announced by W. C. Heath, president.



L. M. KEATING

Mr. Keating replaces B. F. Bart, recently deceased. He is a native Texan, and graduated from the engineering

school of Washington University.

In Houston, Mr. Keating will be in charge of all of the company's interests in Texas, Missouri, Louisiana, Oklahoma, Mississippi, Arkansas, Kansas, Colorado and New Mexico, and will supervise branch offices in Dallas, Midland, Tulsa and New Orleans.

The appointment of T. H. Jones as liquefied petroleum gas specialist was recently announced by J. N. Crawford, vice president in charge of sales, Bryant Heater Co., Cleveland.



T. H. JONES

Mr. Jones is a veteran of 28 years' experience in the water heater business with the former Hoffman Co., of Louisville, Ky.

The new Bryant department head has designed all types of storage, side-arm, continuous flow, and multi-coil gas water heaters, as well as electric

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GREATEST *Magic Chef* **YET!** **FOR LP-GAS RETAILERS**

Features 16 new major improvements. Startling new beauty. This new Magic Chef will be introduced nationally with a tremendous full-page, 2-color advertising campaign. American Stove Company, St. Louis 10, Mo.



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at Its Best***

- ★ Customers can serve a wider variety of fried foods.
- ★ Left-overs or by-products quickly converted into daily specials.
- ★ Increase in customer business means increase in the gas load.
- ★ Actual saving in fat alone more than pays total cost of gas required to operate them.

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and oil-burning storage models. Mr. Jones has served on the board of directors of the Liquefied Petroleum Gas Association as Kentucky representative.

The appointment of Paul B. Borthwick as personnel director was also announced recently by Lyle C. Harvey, president, Bryant Heater.



HARRY ADAMS

Elevation of one of The Weatherhead Co. executives to the vice presidency is announced by A. J. Weatherhead, Jr., president of the Cleveland firm.

Harry L. Adams, the newly appointed vice president in charge of operations, previously operated his own company, Kalamazoo Screw Products, and formerly was connected with such firms as Brown & Sharpe, Bantam Ball Bearing and General Electric.

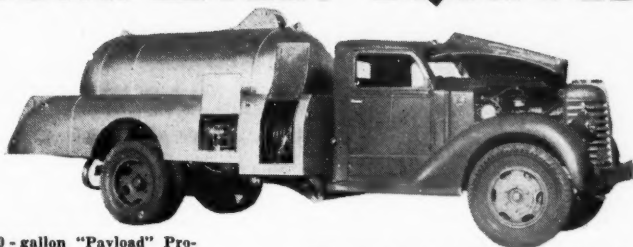
Illinois Bottled Gas Names Ray Lindahl Sales Manager

Ray Lindahl, sales promotion manager of the Illinois Bottled Gas Co., Inc. for the past two years, has been made sales manager of the company's cylinder sales division.

Illinois Bottled Gas, with home offices at 343 S. Dearborn, Chicago, distributes "Dri-gas" to dealers in several states. B. D. Geroy, is general manager of the organization.

Mr. Lindahl has had a wide background in the LP-Gas field. His experience includes extensive sales activities, both in the field and in various administrative capacities.

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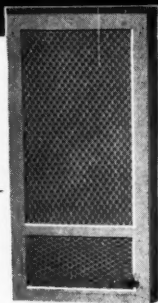
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Send for Literature.

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J. B. Hill Will Handle "Algas" Carburetors in Northern Calif.

J. B. Hill, long associated with the LP-Gas industry on the West Coast, has been appointed factory representative for Algas carburetion equipment in Northern California. His territory will extend from Bakersfield north. Algas equipment is manufactured by American Liquid Gas Co. of Los Angeles.

Mr. Hill has become in recent months factory representative for Superior Valve Co. of Los Angeles and Hollywood Water Heater Co. of Glendale. He has represented Ward Heater Co. of Los Angeles for over four years, specializing in the sale of LP-Gas floor furnaces.

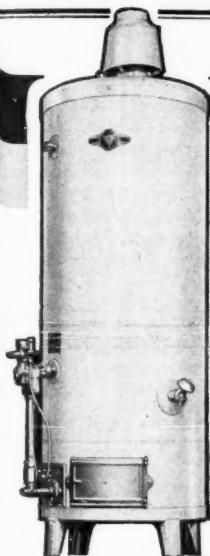
Mr. Hill became interested in the LP-Gas industry in 1930. At that time he was with Ensign Carburetor Co. In 1934 he started the LP-Gas department for Associated Oil Co. in San Francisco.

Cylinder Valve Threads May Be Standardized

A recent bulletin of The Bastian-Blessing Co., Chicago, states:

"As a result of the great difficulty experienced during the war because of the lack of standardization in this country on cylinder valve threads, particularly outlet threads, the Compressed Gas Manufacturers Assn., in cooperation with government agencies undertook several years ago to develop an acceptable program of standardization. The excellent work done by the CGMA has been practically completed, and manufacturers that have worked with the association have pledged themselves to adopt the new standards just as rapidly as possible.

"In developing the standards, the



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Greater grows the demand for SECURITY Automatic Hot Water Heaters. More and more buyers seek the smart appearance, dependable performance, superior workmanship for which SECURITY is famed. Thousands of users are amazed at the efficiency, economy and long life of these gleaming Automatic Water Heaters. Operate on all fuel gasses. Now is the time to look to SECURITY . . . for leadership and for sales!

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| ★ J & S Carburetors | ★ And Many Others |

★ We can install bulk plant pumps and piping
 ★ complete. We have a complete truck pump
 ★ mounting service.
 ★



CGMA organization spent considerable time in working out a standard that would not cause a lot of hardship on the part of industry and its customers. We are advised that in all cases connections made to the new standards can be used with equipment previously furnished by various manufacturers in this country."

The Bastian-Blessing Co. has adopted these standards for all of its production.

A copy of a pamphlet containing details of the CGMA standards may be obtained by addressing that organization.

Dix Will Distribute Fuel Analyzer for Eastern Firm

Dix Manufacturing Co., Los Angeles, has been appointed distributor for the butane-propane fuel analyzer manufactured by Electro Products Co., of New York.

This instrument is used to determine the proper air-fuel ratios to be used with LP-Gas carburetion. The unit analyzes exhaust gases and through its use peak performance can be obtained, it is asserted.

Made for Butane Engines

The Electro analyzer is made for use on engines equipped with butane or propane and is said to be the first designed especially for this work. The complete unit is contained in a small, metal carrying case, making it easy to transport. It is ideal for use in the field or shop. According to users, carburetors can be set under load in operation.

The Dix organization has also taken on the distribution of the "Trapit" filter. It is designed especially for LP-Gas and can be used on any type of butane or propane installation.

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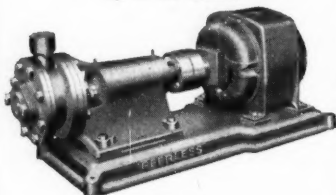


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Hydrocarbons— What Are They?

By **ROY W. MACHEN**
 Consultant, Bay City, Texas

ALL petroleum oils and gases are composed of compounds of hydrogen and carbon. These compounds exist in the form of molecules.

A molecule is the smallest particle into which matter may be divided and the properties of the original substance retained.

An atom is the smallest particle of an element that has all the chemical properties of that substance. A molecule may be divided into atoms. For instance, water may be divided into two atoms of hydrogen and one of oxygen. When this separation takes place, the constitution of the original substance has been destroyed.

A number of atoms bearing like characteristics many times unite to form an element. Such an element is hydrogen. When atoms having different characteristics and of a different sort unite to form a mole-

TWO REGIONAL MEETINGS were held this winter by the Natural Gasoline Association of America, one at Amarillo in December, and the second in Corpus Christi in January. The accompanying paper was presented at the latter.

Both meetings were preliminary to the 20th annual convention of the NGAA in Fort Worth, Texas, March 24-26.



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cule, however, as would one atom of carbon and four atoms of hydrogen, the result is a hydrocarbon compound termed methane, CH_4 .

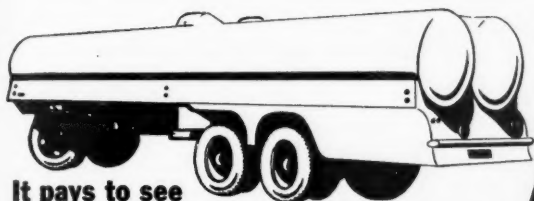
The hydrocarbons that form natural gas, as the term is generally accepted, belong to the paraffin series, which is essentially a straight line chain compound. The quantities of the respective hydrocarbons present in the gas vary for numerous reasons. A simple method of expressing the general relationship is—the greater the gasoline content of the gas the greater the ratio of heavy to light constituents; and the drier the gas the greater the ratio of the light to heavy constituents.

Definition of Normal Compound

A normal compound is one in which no single carbon atom is linked with more than two other carbon atoms. Methane CH_4 , ethane C_2H_6 , and propane C_3H_8 , are all normal hydrocarbons and there are only single examples of these compounds.

There are, however, two compounds that have the same chemical formula, C_4H_{10} , normal butane and isobutane; three pentanes C_5H_{12} , five hexanes C_6H_{14} ; and, as the number of carbon atoms increases in the molecule, the number of compounds having the same elements in the same proportion and represented by the same chemical formula increases. For instance, there are possibly more than 800 compounds having the same formula as tridecane, $\text{C}_{13}\text{H}_{28}$.

All members of the paraffin series are insoluble in, and lighter than,



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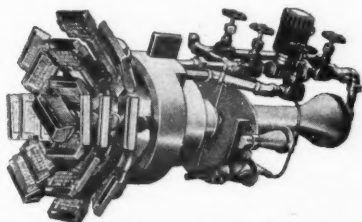
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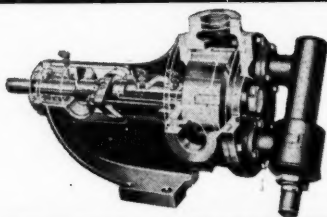
Model LJ-20A is the largest of the series. It is 40" long, 16" wide, weighs 200 lbs. Capacity is 3,200,000 BTU.

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water. The specific gravities increase as the molecular weights increase; and as the molecular weights increase, their boiling points become greater. The heavier members cannot be distilled at atmospheric pressure without decomposition.

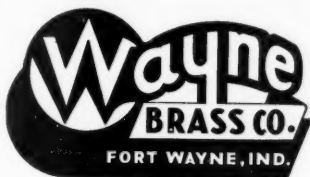
The first four compounds in this series, methane, ethane, propane, and butane, are gases at normal atmospheric temperature and pressure. Compounds having from 5 to 16 carbon atoms are liquids, and those containing more than 16 carbon atoms are solids.

Methane, the chief constituent of natural gas, CH_4 , is colorless, odorless, and slightly soluble in water. It condenses at minus 259°F . and freezes at minus 298°F . It has a specific gravity of 0.554 as compared to air and a heating value of 1009 Btu per cu. ft. of gas.

Methane is Colorless, Odorless

Methane occurs very generally in nature, being formed by the decay of leaves, grass, etc. It is often termed marsh gas. Methane is quite often present in coal mines and frequently is the direct cause of disastrous explosions. Miners call it "fire damp." The specific gravity of methane liquefied is 0.3, which is not an actual gravity but only an apparent value for dissolved methane as compared to water.

Ethane, C_2H_6 , is the next largest constituent in natural gas, from the standpoint of volume. It is slightly odorless, is colorless, has a condensation or boiling point of minus 127°F ., and a freezing or melting point of minus 278°F . It is a gas at normal temperature and pressure, is more easily liquefied than methane, has a specific gravity of 1.038 compared to



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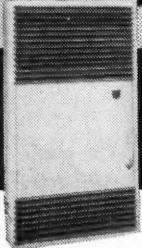
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air, a heating value of 1795 Btu per cu. ft. (in gaseous form). The liquefied specific gravity at saturation pressure is .374 compared to water.

Propane, C_3H_8 , the third member of the series has a sweet, ether-like odor, is colorless, and at ordinary pressure and temperature is a gas. It is normally the lightest constituent of natural gasoline, but is usually found only in the raw make as it is removed in subsequent operation for sale as a liquefied gas or for refrigeration purposes in the plant itself. Its presence in any appreciable amount in the finished gasoline will cause serious trouble because of high vapor pressure and low distillation recovery. Propane boils at minus 44°F., and freezes at minus 310°F., has a specific gravity of 1.523, and a heating value of 2580 Btu per cu. ft. of gas. The API gravity of the liquid is 146.

Have Different Physical Properties

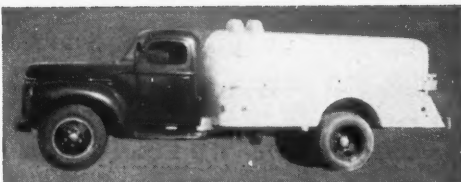
Butane, C_4H_{10} , normally is found as two distinct members of the series, each having the empirical formula, C_4H_{10} , and each having the same molecular weight, 58.08. Although each compound has the same number of carbon and hydrogen atoms in the molecule, the internal structure of the molecule is different. This difference in molecular structure, in turn, gives the two compounds different physical properties.

It is quite desirable to retain the butane in natural gasoline but many plants separate it in operation from raw gasoline by stabilization.

The resulting product is then distributed as a liquefied gas or is used for refrigeration in the plant.

Normal butane has a boiling point of 30.9°F. and freezes at 211°F. In the gaseous form it has a specific gravity of 2.007 as compared to air; as a liquid it has a specific gravity of 0.583 compared with water, and an

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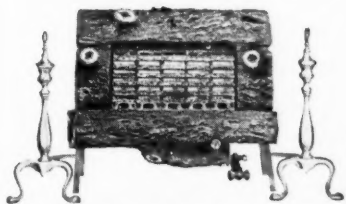
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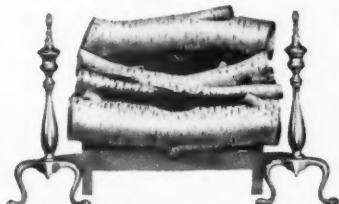
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API gravity of 111. Its heating value as a gas is 3350 Btu per cu. ft.

Isobutane, C_4H_{10} , has a boiling point of $10^\circ F.$, freezes at minus $229^\circ F.$, has a molecular weight of 58.08, specific gravity as a gas of 2.007 compared to air, and a heating value of 3266 Btu per cu. ft. You will note this constituent is essentially still a straight line chain compound with, however, a side chain attached.

Pentane, C_5H_{12} , occurs as three compounds. Only two of these occur in natural gas or gasoline, normal and isopentane, respectively. Both pentanes are symbolized by the same chemical formula; molecular weights 72.10, specific gravity as a gas is 2.491; and several properties of the two fractions are equivalent. Normal pentane, however, boils at $97^\circ F.$, freezes at minus $204^\circ F.$, and has an API gravity (as a liquid) of 93, a specific gravity as a liquid of 0.631, and a heating value of 4007 Btu per cu. ft. as a gas.

Isopentane, C_5H_{12} , which bears the same side chain characteristic as does the isobutane molecule, boils at $82.4^\circ F.$, freezes at minus $256^\circ F.$, has an API gravity (as a liquid) of 95, a specific gravity as a liquid of 0.625, and a heating value of 4012 Btu per cu. ft. as a gas.

Most Desirable Hydrocarbons

The pentanes and heavier are the most desirable hydrocarbons as they constitute the greater volume in natural gasoline. For that reason it was accepted practice for a number of years to "lump" all the hydrocarbons above butane into the grouping "Pentanes Plus" on the gas analysis sheet. At the present time, however, laboratories are inclined to carry their analysis more into detail, separating the pentanes, showing them as individual constituents and classifying only the hexanes and heavier as "Hexanes Plus."

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Hexane, C_6H_{14} ; heptane, C_7H_{16} ; and octane, C_8H_{18} , are to be found in most natural gases and gasolines to some extent. There are many gases in which the hydrocarbon, octane, is characterized by its absence. In gases when it is present, the proportion is usually quite small.

In the natural gasoline extraction process, primary interest is in the extraction of all pentanes and heavier, together with the butane as the specified gravity, vapor pressure, and distillation recovery of the finished product will permit. Most modern plants also extract the remaining butanes not needed in the natural gasoline, and the propane, and market these fractions as liquefied gases conforming to accepted specifications. A few plants go further and extract a portion of the ethane.

The present demand for the increased manufacture of the liquefied hydrocarbon gases creates a demand for efficient fractionation. In the natural gasoline plant fractionation is the primary basis for efficient extraction in the absorber, separation of the constituents absorbed from the gas by the oil from the absorption medium, and in the segregation of various hydrocarbon groups in the stabilization units.

The attainment of a better working knowledge of the fundamentals of physics and chemistry by the operating personnel should make for a more efficient plant operation.

H. H. Miles Opens Tulsa Office

The H. H. Miles Co. has opened an office at 303 Tuloma Bldg., Tulsa, to handle LP-Gas equipment and anhydrous ammonia fittings and tanks. The firm will sell a complete line of bulk storage and other LP-Gas items.